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Public Works and Public Finance

Prompt Action Needed to Prevent Rescinding of Many PWA Allotments

COINCIDENT with announcing the rescission of 97 previously awarded allotments of loans and grants for construction of non-Federal projects, Public Works Administrator Harold L. Ickes said last month that 563 more non-Federal allotments will be rescinded unless the recipients take immediate steps to get their projects under construction with men on the payrolls at job sites and in industries where materials will be produced. Administrator Ickes said:

"So far as PWA is concerned, these 563 projects are all set and ready to go, and have been for weeks. Bond contracts and grant agreements have been drawn up, sent out to the applicants, signed by them and returned to Washington and then signed by me. The money is available. All that remains is the most important thing—putting men to work."

Farsighted Planning Demonstrates Its Value

THE value of farsighted planning for public works has been proved without a doubt, according to the National Planning Board, which has just completed a survey of planning activities throughout the country coincident with the ending of the first year of PWA.

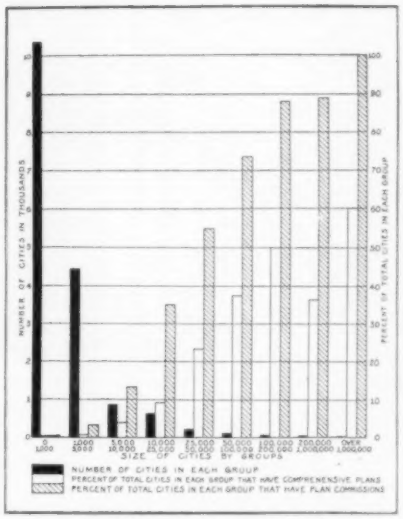
In a report to Public Works Administrator Harold L. Ickes, released on June 24, the National Planning Board states that there are now in the United States 739 city planning boards, 717 of which are official agencies. City planning boards have been set up in 43 states and the District of Columbia.

Comprehensive city plans have been prepared in 218 cities, the National Planning Board informed Administrator Ickes. Of this number, 163 have been officially approved by the city planning boards and 105 of these have been adopted by city councils.

State planning activity has steadily increased through the National Planning Board and its District Chairmen, the former PWA regional advisers, reinforced by a general public awakening to the value and necessity of planning on a broader scale than heretofore.

The only states without planning boards are Mississippi, Massachusetts, Louisiana, North Carolina, West Virginia, Delaware, Pennsylvania, Rhode Island and Texas. In several of these, however, definite progress is being made in the organization of an official state planning board.

In its report to the Administrator the National Planning Board said:


NUMBER OF CITIES IN THOUSANDS
PERCENT OF TOTAL CITIES IN EACH GROUP
SIZE OF CITIES BY GROUPS
NUMBER OF CITIES IN EACH GROUP
PERCENT OF TOTAL CITIES IN EACH GROUP THAT HAVE COMPREHENSIVE PLANS
PERCENT OF TOTAL CITIES IN EACH GROUP THAT HAVE PLAN COMMISSIONS

NATIONAL PLANNING BOARD CHARTS LOCAL BOARDS AND COMMISSIONS

"Planning must appeal to the public as the sensible and economical method of determining the long-time public works program. This can be accomplished, however, only by continuous educational efforts aimed at thoroughly acquainting each and every citizen with the purposes or objectives and advantages of planning well in advance of development.

"All this means that there is much work ahead. Planning must be started in many cities and counties, especially in those cities with a population of 25,000 or more. Many planning commissions must take up their jobs more efficiently and with broader vision applied to solution of their problems."

Costs and Revenues of State and Local Governments

LARGE headlines in some of the newspapers have announced that governmental costs in the 182,659 political units in the United States (exclusive of the Federal Government) have been found by the Bureau of the Census to have totaled for the year 1932 the substantial sum of $9,662,615,000. Many hasty readers have assumed that the annual "tax burden" must have amounted to a similar sum. An analysis of the official release from Washington, dated June 16, 1934, shows such conclusions to be quite unfounded.

The above-mentioned total comprises $6,049,108,000 for operation and maintenance of general departments, $307,944,000 for operation and maintenance of public service enterprises; $843,868,000 for interest on debt; and $2,361,695,000 for outlays or permanent improvements.

Revenue Receipts

As compared with these expenditures, the total levies of the general property tax for the states, counties and all other civil divisions were $5,026,753,000 for 1932, equivalent to $40.37 per capita. Actual collections of the general property tax for that year amounted to $4,684,784,000. Other revenue collections included: $418,141,000, special taxes; $18,458,000, poll taxes; $1,236,364,000, licenses and permits; $321,165,000, special assessment; $938,647,000, subvention, donations and pension assessments; $256,106,000, interest, rents and highway privileges; $529,998,000, earnings of public service enterprises; $411,941,000, earnings of general departments; and $36,313,000, fines, forfeits and escheats. Of the $938,647,000 classified as subventions, donations and pension assessments, $238,068,000 represents subventions by the Federal Government to the states, principally for highways.

For 1932 the aggregate of revenue receipts was $1,650,997,000 more than the governmental-cost payments, exclusive of those for capital outlays, but $710,698,000 less than the total payments, including those for capital outlays. Receipts from the issue of debt obligations are not classed as revenue receipts, or payments on account of debt obligations as governmental-cost payments.

Public Indebtedness

For 1932 the combined gross debt of the states and all other civil divisions, less sinking-fund assets set aside to meet such debt, was $17,589,515,000, or an average per capita of $141.27. In 1922 the average per capita was $79.90, and in 1912, $69.41.

Of the total debt reported for 1932, $2,373,634,000 was for the state governments; $2,390,830,000 for the counties; $8,842,189,000 for the cities, towns, villages and boroughs; $2,039,852,000 for the school districts; $343,879,000 for the townships; and $1,599,131,000 for the other civil divisions.

Assessed Valuations

The assessed valuation of all property in the 48 states and the District of Columbia subject to levies of the general property tax was $163,317,104,000 in 1932 as compared with $124,616,675,000 in 1922 and $69,452,936,000 in 1912. The per capita assessed valuation increased from $715.48 in 1912 to $1,146.16 in 1922, and $1,311.67 in 1932.

The average rate of levy per $100 of the assessed valuation was $1.94 for 1912, $2.81 for 1922, and $3.08 for 1932.

CITIES with large elevated water tanks will appreciate their value this summer. When hot days push peak loads higher and higher, these tanks will supply the extra water needed to prevent water shortage just when it would cause the most damage.

Elevated storage can be used to advantage by both large and small cities. The illustration above shows a 1,000,000-gallon elevated tank at Miami, Florida.

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Water Supply and Purification

Water Spreading

THE use of water spreading, or artificial replenishment of underground basins, is by no means of recent origin. Apparently the first actual spreading of water for this purpose was done by the Irvine Ranch Co., from Santiago Creek in Orange County, Calif., about 1896. There are four primary methods of groundwater artificial replenishment. The original method of spreading on the débris cones by means of ditches after the flood flows had passed and the water became clear, has become more efficient and a greater amount made available by the construction of flood control reservoirs. These reservoirs act as desilting basins and make not only a larger amount of water available but also extend the period of operation, reducing the amount of land necessary for spreading. In many cases this regulation makes it possible to handle the entire flow of the stream in the natural channel without the construction of works or labor.

In some basins in California, such as the San Fernando Valley, the natural groundwater is augmented by the spreading of so-called foreign water, such as the Owens River Aqueduct water. In other groundwater basins water spreading can only be accomplished by means of wells piercing the clay blankets which separate the various waterbearing stratas.

In some districts, such as that immediately adjacent to the coast of Los Angeles County, in the future it will become necessary for all industrial consumers to use reclaimed sewage water, allowing their local groundwater to have a natural recovery by lack of demand.

There is no general rule or plan of water spreading that may be laid down as applicable to all groundwater basins. Each area must be taken as a separate problem and studied not only from the possibilities of water spreading, but also the effect on the groundwater table and the ability to recover the water so spread by those paying the cost of the operation.

During the past ten years, numerous water companies and agencies have carried on spreading of one type or another. However, there are little or no published data of sufficient accuracy to be of use to those studying the problem. In several instances, rates of percolation were of little or no interest to those carrying on the work, owing to the fact that the area owned or controlled by them was more than sufficient to take care of the amount of water available.

In Southern California the greatest problem confronting water users is sufficient storage to smooth out the seasonal fluctuations and insure a safe and adequate supply during those months of greatest demand. Surface reservoir sites are few in number and exceedingly expensive per acre-foot of storage.

—From a paper presented before the California Section, American Water Works Association, by D. A. LANE, Assistant Engineer, Groundwater Development, Department of Water and Power, Los Angeles, Calif.

The Hardness of Large Public Water Supplies

THE table below gives the approximate average hardness of the public water supplies of cities in the United States with populations over 150,000, in 1932. Single results for hardness are adequate for some of the places that obtain supplies from large lakes or reservoirs or from single sources of ground water, but for some places no single result is adequate. Supplies from rivers vary in hardness with the seasons. In times of low water the hardness may be from 25 to 50 per cent greater than the average; in times of high water it may be 25 to 50 per cent less than the average. For such supplies the fact of the variability is indicated by a footnote. Some places are supplied from several different sources which differ considerably in hardness. For some of these places the hardness is given for the different sources, and for others only an average is given.

Brief descriptions of the supplies and additional analytical data as of 1921 are given in Geological Survey Water Supply Paper 496, which includes all cities with population of over 25,000 in 1920. This report has been out of print for several years but is available in many public and university libraries. The hardness given in the accompanying table differs from that given in Paper 496 for some places that have changed their source of supply or method of treatment.

Nineteen places that are included in Water Supply Paper 496 were using in 1932 water that was decidedly softer or harder than was indicated in 1921. Some of the differences are due to changes in source of treatment; a few are due to the fact that the published results were probably not representative of average conditions in 1921. The short table gives the approximate average hardness for the 19 supplies for which the results in Water Supply Paper 496 are not now available. Data for supplies of many smaller places and for the waters used for private supplies in different areas are given in a large number of reports listed in Geological Survey Water Supply Papers 560-C and 659-C, which are for sale by the Superintendent of Documents, Government Printing Office, Washington, D. C., for 5 cents each. Many of the reports listed in these publications are out of print but are available for consultation in libraries.

APPROXIMATE AVERAGE HARDNESS (AS $CaCO_3$) OF SOME PUBLIC WATER SUPPLIES IN 1932
(Parts per Million)

Austin, Texas	81
Bloomington, Ill.	77
Casper, Wyo.	234
Cedar Rapids, Iowa	88
Decatur, Ill.	116
Fort Smith, Ark.	89
Fresno, Calif.	87
Knoxville, Tenn.	103
Kokomo, Ind.	517
Marion, Ohio	212
Miami, Fla.	80
Newark, Ohio	79
Quincy, Ill.	78
Saginaw, Mich.	107
Springfield, Ill.	108
Stockton, Calif.	70
Tampa, Fla.	103
Tulsa, Okla.	80
Wichita Falls, Texas	261

APPROXIMATE AVERAGE HARDNESS (AS $CaCO_3$) OF LARGER PUBLIC WATER SUPPLIES IN THE UNITED STATES, 1932

Place	Population Supplied (Thousands)	Hardness (Parts per Million)
Akron, Ohio	225	*100
Atlanta, Ga.	270	14
Baltimore, Md.	805	54
Birmingham, Ala.	305	*67
Boston, Mass. (Met. Dist.)	1,385	15
Bridgeport, Conn.	185	15
Buffalo, N. Y.	573	118
Chicago, Ill.	3,679	125
Cincinnati, Ohio	451	*110
Cleveland, Ohio	1,200	120
Columbus, Ohio	291	*84
Dallas, Texas	260	*69
Dayton, Ohio	201	368
Denver, Col.	288	*121
Detroit, Mich.	1,798	97
Flint, Mich.	156	*298
Fort Worth, Texas	163	*164
Grand Rapids, Mich.	169	*123
Hartford, Conn.	208	17
Houston, Texas	292	**85
Indianapolis, Ind.	364	
White River		*280
Wells		316
Jersey City, N. J.	404	55
Kansas City, Mo.	419	*221
Los Angeles, Calif.	1,238	
Owens River		*140
Los Angeles River		*205
Louisville, Ky.	308	*110
Memphis, Tenn.	253	39
Milwaukee, Wis.	652	126
Minneapolis, Minn.	464	*172
Nashville, Tenn.	154	*80
Newark, N. J.	1,045	
Pequannock Supply		29
Wanaque Res. (North Jersey Dist.)		50
New Haven, Conn.	242	
Lake Whitney		69
Lake Dawson		22
Lake Gaillard		48
New Orleans, La.	459	*72
New York, N. Y.	6,930	
Catskill supply		20
Croton supply		51
Ridgewood supply		*70
Oakland, Calif.	457	**70
Oklahoma City, Okla.	185	*121
Omaha, Nebr.	214	*251
Philadelphia, Pa.	1,951	
Delaware River		*69
Schuylkill River		*120
Phila. Suburban District, Pa.	315	62
Pittsburgh, Pa.	985	*90
Portland, Ore.	302	8
Providence, R. I.	314	32
Richmond, Va.	183	*56
Rochester, N. Y.	382	
Hemlock Lake		75
Lake Ontario		105
St. Louis, Mo.	822	*83
St. Paul, Minn.	272	160
San Antonio, Texas	232	221
San Francisco, Calif.	634	**150
Scranton, Pa.	214	**30
Seattle, Wash.	366	21
Syracuse, N. Y.	209	113
Toledo, Ohio	291	*253
Washington, D. C.	503	*93
Worcester, Mass.	195	11
Youngstown, Ohio	185	81
Total	35,348	

* Varies over a wide range.

** Estimated.

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HIGHWAYS—ADMINISTRATION—MAINTENANCE

$200,000,000 Highway Fund Apportioned to the States

THE highway appropriation authorized by the Hayden-Cartwright Act, signed June 18, 1934, by President Roosevelt for highway construction under the provisions of the National Industrial Recovery Act, has already been apportioned by Acting Secretary of Agriculture Tugwell. Following the requirements of the law, ⅞ of the fund is apportioned under three divisions of equal weight based upon the area, population and rural post-road mileage of the several states and Hawaii. The remaining one-eighth, as provided by law, is apportioned according to population. By regulation, one-quarter of the funds available will be spent on state routes within cities.

The money is immediately available for allotment to construction projects on the Federal aid highway system and its extensions into and through cities and on important secondary roads. The law requires that, in the absence of satisfactory reasons to the contrary, not less than 25 per cent of the apportionment to any state must be applied to secondary or feeder roads, including farm-to-market roads, rural free delivery roads, and public school bus roads.

The amounts apportioned to each state, Hawaii and the District of Columbia are as follows:

	Sums Apportioned Seven-Eighths According to Sec. 21 of the Fed. Hwy. Act	One-Eighth According to Population	Total Apportionment
Alabama	$3,722,613	$537,229	$4,259,842
Arizona	2,553,507	88,428	2,641,935
Arkansas	3,051,561	376,488	3,428,049
California	6,779,637	1,152,569	7,932,206
Colorado	3,275,724	210,282	3,486,006
Connecticut	1,128,642	326,226	1,454,868
Delaware	875,000	48,395	923,395
Florida	2,363,274	298,069	2,661,343
Georgia	4,523,020	590,471	5,113,491
Idaho	2,187,138	90,348	2,277,486
Illinois	7,372,261	1,549,140	8,921,401
Indiana	4,431,497	657,436	5,088,963
Iowa	4,616,722	501,639	5,118,361
Kansas	4,735,803	381,872	5,117,675
Kentucky	3,287,509	530,802	3,818,311
Louisiana	2,537,276	426,656	2,963,932
Maine	1,549,697	161,889	1,711,586
Maryland	1,478,833	331,225	1,810,058
Massachusetts	2,487,737	862,737	3,350,474
Michigan	5,469,502	983,066	6,452,568
Minnesota	4,905,029	520,522	5,425,551
Mississippi	3,132,202	408,025	3,540,227
Missouri	5,436,923	736,817	6,173,740
Montana	3,660,592	109,142	3,769,734
Nebraska	3,684,616	279,748	3,964,364
Nevada	2,283,870	18,486	2,302,356
New Hampshire	875,000	94,462	969,462
New Jersey	2,400,426	820,453	3,220,879
New Mexico	2,855,760	85,940	2,941,700
New York	8,772,350	2,555,571	11,327,921
North Carolina	4,197,326	643,615	4,840,941
North Dakota	2,800,745	138,222	2,938,967
Ohio	6,515,630	1,349,382	7,865,012
Oklahoma	4,198,747	486,433	4,685,180
Oregon	2,904,181	193,633	3,097,814
Pennsylvania	7,635,476	1,955,312	9,590,788
Rhode Island	875,000	139,572	1,014,572
South Carolina	2,417,958	352,996	2,770,954
South Dakota	2,906,984	140,659	3,047,643
Tennessee	3,771,790	531,201	4,302,991
Texas	11,108,746	1,182,507	12,291,253
Utah	2,029,590	103,101	2,132,691
Vermont	875,000	73,007	948,007
Virginia	3,273,714	491,673	3,765,387
Washington	2,789,019	317,393	3,106,412
West Virginia	1,929,280	351,055	2,280,335
Wisconsin	4,345,174	596,663	4,941,837
Wyoming	2,241,919	45,793	2,287,712
District of Columbia	875,000	98,842	973,842
Hawaii	875,000	74,778	949,778
Totals	175,000,000	25,000,000	200,000,000

Public Administration Service Expands

PUBLIC Administration Service, the joint agency of ten national associations of public officials organized to improve administrative standards of government, has announced the entrance of two additional organizations into its group. The American Society of Municipal Engineers, formed in 1894, and the International Association of Public Works Officials, formed in 1919, are the two new organizations. A nation-wide congress of public works and engineering officials is announced by Public Administration Service as the first joint project of the two groups. This will take place in Rochester, N. Y., September 24-28, 1934.

Certain problems faced by public works officials today will be discussed at the conference. A review of the efficiencies and deficiencies of CWA and of the present Federal relief work program as related to cities will be a major subject of the congress.

Reflecting the changing scope of duties of the public works engineer, whose job at present is not so much technical designing as it is managing new public works services to cities, such as slum clearance, planning and work relief programs, the group will also discuss the principles of public works management. Under this heading will come the organization of public works departments, public works budget and cost controls, and the selection and training of people for the jobs.

Organizations which are members of Public Administration Service now include Public Administration Clearing House, American Public Welfare Association, American Municipal Association, United States Conference of Mayors, Municipal Finance Officers' Association, International City Managers' Association, American Legislators' Association, National Association of Housing Officials, Governmental Research Association, National Municipal League, and the two new associations.

Cane Mat Foundations for Roads Over Muck

A TOWNSHIP in western Netherlands, which lies below sea level and where the soil is unstable mud of unknown depth, has had difficulty in getting permanent roadbeds to carry heavy traffic in the bulb districts. A trial section has been built using reed mats, after their successful use in a railroad grade. The canes, or reeds, are very resistant to rot, having been used for roofs some of which have been in service for 250 years.

The reeds are impregnated with creosote, then woven into mats 2 inches thick. Drain tile are laid in the soil, a 2-inch layer of sand is placed on the subgrade, then the mats are placed and the surface is completed with brick filled with asphalt. The section of road was opened in October with heavy truck traffic.

—From a U. S. Department of Commerce Report.

Maintenance Costs Cut by Improving Highways

PAVED trunk highways, carrying the heaviest traffic, require the smallest maintenance expenditure, according to Minnesota State Highway Department figures. Maintenance of concrete slabs in 1931 averaged $97.61 per mile. This included crack filling, lifting sags with a Mud-Jack, and replacing broken spots in the older pavements. Adding shoulder repair, snow removal, mowing, repair of ditches and culverts, signs, and miscellaneous, the total expenditure averaged $249.36 per mile. The paved routes carried an average of 2,309 vehicles per day.

Gravel roads, with less than one-third as much traffic, cost more to maintain. The average cost of maintaining 2,948 miles of untreated gravel road was $339.00 per mile for all items except regraveling. The maintenance division regraveled 1,601 miles at an average cost of $256.00 per mile.

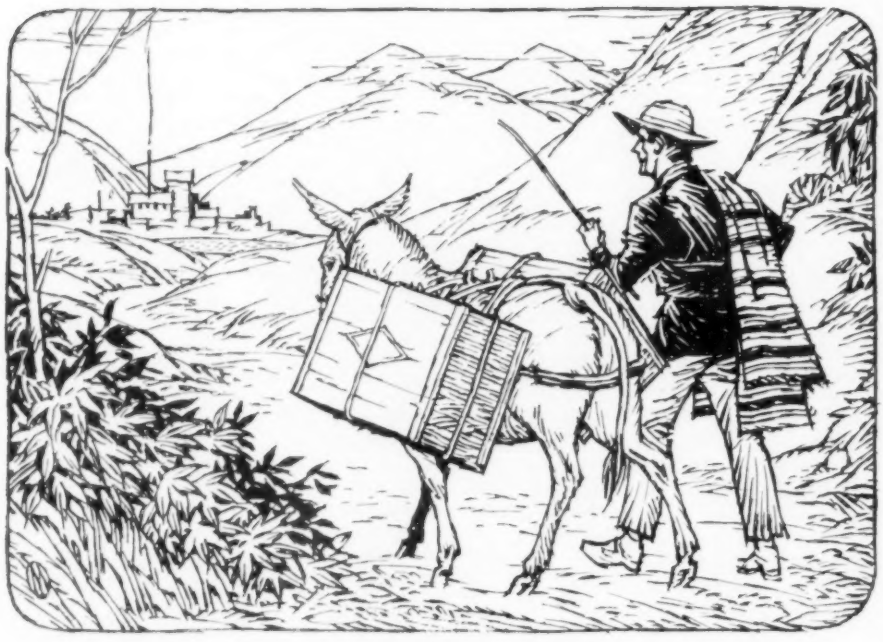
The more heavily traveled gravel roads were bituminous treated. The average cost per mile of 1,589 miles of new treatment or retreatment was $1,069. There were 291 miles of bituminous gravel on which retreatment was not required. These showed an average expense of $176.00 per mile for maintenance of the roadway, and a total of $280.60 per mile with snow removal, roadside maintenance and all other items included.

Vitrified Paving Brick Simplified Practice Reaffirmed

SIMPLIFIED practice recommendation R1-32, covering vitrified paving brick, has been reaffirmed again without change as of June 15, 1934, by the Standing Committee of the Paving Brick Industry, in charge of the periodic review of this program. This recommendation, which was first proposed and developed by the industry in 1921, has since that time been reviewed annually and revised seven times.

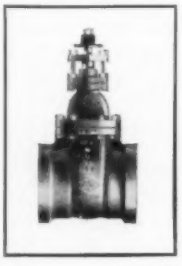
In 1921, vitrified paving brick was available in 66 different sizes. The original recommendation reduced this variety to 11, and the first revision conference further reduced the number to 7 sizes. Subsequent conferences and surveys have resulted in a net reduction to 6 sizes.

Answering Calls *from far places*



FROM every quarter of the earth—from mines in the Andes and factories in Australia—from refineries in Roumania and canneries in Japan—from shipyards in Britain and steam plants in Africa, come a ceaseless flow of orders for Jenkins Valves.

This universal faith in Jenkins Valves is a tribute that engineers everywhere pay to correct design, superior quality and dependable performance. It is a faith that we value highly, and it places a responsibility upon us which we gladly accept. In the future, as in the past, Jenkins Valves will represent those advanced but sound engineering principles and manufacturing practices, so essential to economical and satisfactory valve service.



Whether you require bronze, iron, or steel valves, the purchase of Jenkins Valves is always an economy, never an extravagance.

Men who "know" valves will recognize the excellence of Jenkins Iron Body Gate Valve design and construction. There are 18 important features, clearly shown in the life-like cut-out model of a "Jenkins" which your supply house will give you. Use it to compare with other valves. See the Jenkins Catalog for details on Iron Body Gates with Solid Wedge or Double Disc Parallel Seat in sizes to 48 inches.

Jenkins Bros

JENKINS BROS., 80 White Street, New York, N. Y.
10 Main Street, Bridgeport, Conn.; 524 Atlantic Avenue, Boston, Mass.; 133 N. Seventh Street, Philadelphia, Pa.; 822 Washington Boulevard, Chicago, Illinois; JENKINS BROS., Limited, Montreal, Canada; London, England

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Sewerage and Sewage Disposal

Sewage Treatment Works for Combined Sewer Systems

IN the design of sewage treatment works to receive the flow from combined sewers, provision must be made not only for handling the excess flow during storms, but also for taking care of the greatly increased quantity of mineral and organic solids representing the wash from streets and the flushing-out of deposits stranded on the sides and bottom of large sewers during low-velocity periods since the preceding storm. As most by-passes for excess storm water are of the overflow type, a large per cent of those solids which have specific gravities greater than water are carried into the treatment works. The various types of mechanically cleaned grit chambers which have been developed in recent years undoubtedly are more effective in removing these mineral solids than the older type of channel grit chambers which generally were not cleaned until the storm had passed, and frequently not in time to handle the grit from a closely following storm.

In this country there is no uniformity of procedure in dealing with storm water, but some recent designs show the influence of well-standardized British practices with adaptation to our larger per capita sewage flows. In England, regulations of the Ministry of Health require that flows up to three times the ordinary dry-weather flow be taken through the treatment plant and that special storm-water tanks be provided for sedimentation of flows between three and six times dry-weather flow. As per capita water consumption and sewage flow in the United States generally range from two to four or more times than in English cities, the equivalent capacity of storm tanks to be provided here would range from two to perhaps four times the dry-weather flow, which would not materially increase the total cost of the works. The liquid remaining in the tanks is pumped through the regular treatment works when flow conditions have returned to normal following the storm. These storm tanks serve to reduce the pollution of the stream and guard against formation of sludge banks in the stream and objectionable-appearing and foul-smelling deposits on the shore in the vicinity of overflows.

—From a paper by C. A. Emerson, Jr., of Fuller and McClintock, consulting engineers, New York, presented before the seventh annual conference of the Pennsylvania Sewage Works Association.

New Charts Show Frequency and Intensity of Heavy Rains

TO successfully design a municipal storm-sewer system large enough to take care of the storm water safely and within the appropriations available, engineers must know how much rain is ever likely to fall in 5 minutes, in 15 minutes and in an hour or more. They also need to know how often these sudden downpours are likely to occur. This information is also valuable to engineers designing culvert openings for small watersheds. D. L. Yarnell, of the Bureau of Agricultural Engineering, U. S. Department of Agriculture, has just finished charting rates of precipitations and their frequencies for the 206 Weather Bureau stations which have automatic rain-gages. The data cover periods of from 10 years up to 30 years or more. Baltimore, for example, has records for 38 years. Certain localities have been interested in records of the intensity and frequency of short heavy rains in their own vicinities, but this is the first attempt on the part of any individual or agency to coordinate the information for the entire country.

Because a storm of great intensity usually extends over only a small area, Yarnell believes that this study is sufficiently comprehensive for a reasonably accurate estimate as to how often a rain of a given intensity is likely to occur in any region of the United States. From the records of the Baltimore, Md., station, it is possible to tell how many heavy rainstorms of short duration are likely to occur in any month of the year for that city and vicinity. Once in about five years, for a 5-minute period, the citizens of Baltimore and vicinity can expect a rainfall at the rate of 6.2 inches an hour, or 0.51-inch in five minutes; once in 10 years a rain at the rate of 6.82 inches an hour, or 1.14 inches in 10 minutes. Based on 0.51-inch in 5 minutes, on a city lot 50 x 100 feet, 212 cubic feet or 1,588 gallons of water would fall. This quantity must be carried off from every paved area of this size and disposed of by the storm sewer without flooding.

For a period of 38 years, 1896-1933, the maximum amount of rain that ever fell in Baltimore in a 5-minute period was 0.70-inch, and for a 15-minute period, 2.08 inches. Yarnell's chart shows the maximum amounts for periods of 5 minutes up to 400 minutes.

What has been charted for Baltimore has also been charted for each of the other 205 Weather Bureau stations in the United States that have automatic rain-gages, and also for the stations in Porto Rico and Hawaii.

New Type Sewage Disposal Plant Built by Arc Welding

AN odorless, non-bacterial sewage disposal plant of a new type has been completed recently at the City of David, Benton Harbor, Mich. The plant is noteworthy in that it occupies a very small area, and is practically self-sustaining, since waste gases are utilized as fuel and valuable by-products are obtained and sold. The equipment includes four tanks of 6,000, 3,000, 2,000 and 1,000 gallons capacity and the necessary piping, heaters, etc. The tanks are built of 3/16-inch steel plate arc welded to provide airtight joints.

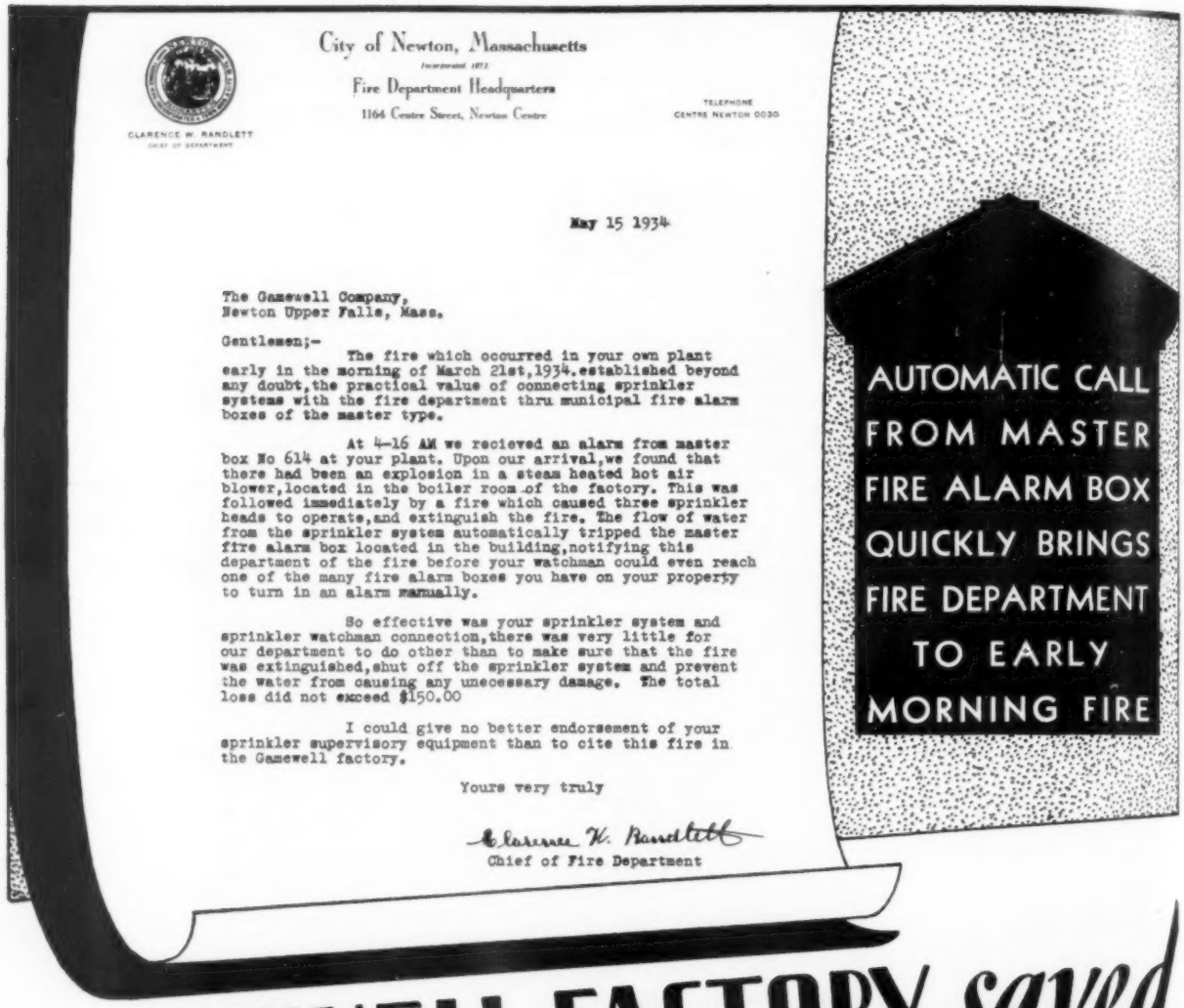
Sewage enters the plant through a mixing device where it is treated with milk of lime and a carbon compound; the carbon compound is obtained from distillation of the sewage sludge. The carbon absorbs all gases and odors. From the mixer the sewage drops into a wet well or pump sump. As the pump starts, ferric chloride is supplied to the mixture by a mechanical feed geared to the pump switch. The resulting mixture is pumped into the coagulation tank. This tank has a partition separating the upper third of the tank from the lower section, which is conical. The liquid remaining is clear and odorless and passes upward on the other side of the partition, where it is drawn off by gravity into filters through an aerator.

The filters contain a mat of carbon overlying 16 inches of sand and gravel, and after the effluent passes through this filtering material and the underdrains, it is drawn off by gravity into a receiving tank. A large valve is set in the conical bottom of the coagulation tank, where the solids have been precipitated, so that the hydrostatic pressure of the supernatant liquid forces it out into a series of sludge tanks. The sludge is drawn off at suitable periods and allowed to dry. After 48 hours of drying, the sludge contains about 70 per cent water. It is then removed to a retort. When sufficient sludge is gathered, heat is applied to the retort by an oil burner and the temperature raised to about 800 degrees, driving off the moisture and highly volatile gases into a condenser and from there into a holding tank, where the liquid collects in the bottom and the free gases are used as auxiliary fuel under the retort. The carbon compound left in the retort after the distillation is powdered and used in the feed machine at the initial stage of the process.

The process was developed by A. R. Putnam, sanitary engineer, of Valparaiso, Ind., and the plant was built by the Twin City Boiler Works, Benton Harbor, Mich. All welding was done with electrodes manufactured by The Lincoln Electric Co., Cleveland, Ohio. It is estimated that the savings in arc welding over riveting the tanks amounted to 33 per cent.

The 1934 Municipal Index

One of the features of the 1934 Index will be an article on "The Status of Sewage Disposal Today," by Wellington Donaldson, of Fuller & McClintock, consulting engineers, New York. In addition, water rates and service charges, supplementing those already appearing currently in The American City beginning in May will be included in the Water Supply Section.


City of Newton, Massachusetts
Incorporated 1873
Fire Department Headquarters
1164 Centre Street, Newton Centre
TELEPHONE
CENTRE NEWTON 0030
CLARENCE W. RANDLETT
CHIEF OF DEPARTMENT
May 15 1934
The Gamewell Company,
Newton Upper Falls, Mass.
Gentlemen;-
The fire which occurred in your own plant early in the morning of March 21st,1934.established beyond any doubt,the practical value of connecting sprinkler systems with the fire department thru municipal fire alarm boxes of the master type.
At 4-16 AM we recieved an alarm from master box No 614 at your plant. Upon our arrival,we found that there had been an explosion in a steam heated hot air blower,located in the boiler room of the factory. This was followed immediately by a fire which caused three sprinkler heads to operate,and extinguish the fire. The flow of water from the sprinkler system automatically tripped the master fire alarm box located in the building,notifying this department of the fire before your watchman could even reach one of the many fire alarm boxes you have on your property to turn in an alarm manually.
So effective was your sprinkler system and sprinkler watchman connection,there was very little for our department to do other than to make sure that the fire was extinguished,shut off the sprinkler system and prevent the water from causing any unecessary damage. The total loss did not exceed $150.00
I could give no better endorsement of your sprinkler supervisory equipment than to cite this fire in the Gamewell factory.
Yours very truly
Clarence W. Randlett
Chief of Fire Department
AUTOMATIC CALL FROM MASTER FIRE ALARM BOX QUICKLY BRINGS FIRE DEPARTMENT TO EARLY MORNING FIRE

GAMEWELL FACTORY *saved* FROM HEAVY FIRE LOSS —*by OWN APPARATUS*

It wasn't necessary for us to have an explosion and fire in our own plant to convince us of the value of connecting sprinkler systems with the municipal fire department through a Gamewell master fire alarm box (*known as the Sprinkler Watchman*). The service record of our *Sprinkler Watchman* hook-up in hundreds of other properties had convinced us on that.

Fire Chief Clarence W. Randlett of Newton, Mass., tells us in the above letter how our *Sprinkler Watchman* hook-up saved our own plant from a heavy loss. This is just one more case illustrating the value of a sprinkler system connected to the fire department through the dependable Gamewell master fire alarm box.

Every fire chief should encourage the sprinklered properties in his city to install this *Sprinkler Watchman* hook-up. It will save your city thousands of dollars loss in taxable property and prevent your taxpayers from being thrown out of work because of factories being destroyed by fire. We shall be glad to send you literature on our *Sprinkler Watchman*.

The
GAMEWELL COMPANY
Newton, Massachusetts
"A Box a Block"

Fire and Police Departments

*Confliction of Duties of Building Inspectors and Fire Prevention Bureaus**

THE development of fire prevention bureaus in fire departments is of recent origin. Most of these bureaus have been organized in the last ten years. Practically every large city in the United States has such a bureau in its fire department at the present time, the three principal exceptions being Buffalo, Pittsburgh and St. Louis.

It is perhaps natural that some confusion has arisen as to the powers and duties of these bureaus and possible confliction with the powers and duties of city building departments. It is certainly important that the exact function of these bureaus should be defined and possible overlapping and working at cross-purposes with city building departments eliminated.

Function of a Building Inspector

In order to clearly understand this situation, we should define the powers and duties of each department. Probably as good a definition of the function of a building inspector as any that is found in the building laws of the city of Providence R. I., from which I quote as follows:

"The Building Inspector is charged with the duty of executing the provisions of the building code, rules adopted and made a part of the building code and any ordinances and rules in amendment thereof and in addition thereto, except as otherwise herein provided. He shall have the power and it shall be his duty to issue permits, notices and certificates, to pass upon questions relative to the mode, manner or construction of materials to be used, the erection or alteration of buildings, to require that such mode, method or construction of materials shall conform with the true intent and meaning of the several provisions of this code and of said rules, and shall keep a record of his doings. He shall examine all buildings in course of erection, alteration, or repair as often as practicable and shall make a record of all violations of said ordinances and rules, together with the street and number where such violations are found, the name of the owner, lessee, occupants, architect and master mechanics, and all other matters relative thereto, and shall report all such violations to the City Solicitor or other proper officer for prosecution. He shall examine all buildings reported dangerous, whether from fire or any other cause, and make a record of such examinations with the name of the street and the number of the building, the name of the owner, lessee, and for what purpose occupied, and shall examine all buildings under application to raze, enlarge, or build upon and make a record of the condition of the same."

Fire Prevention Bureau's Duties Defined

The best definition of the powers and duties of a fire prevention bureau is contained in the model suggested ordinance establishing a bureau of fire prevention recommended by the National Fire Protection Association. This definition is as follows:

"It shall be the duty of the officers of the Bureau of Fire Prevention to enforce all laws and ordinances of the state and city covering the following:

"1. Prevention of fires;
"2. The storage and use of explosives and flammables;
"3. The installation and maintenance of automatic and other fire-alarm systems, and fire-extinguishing equipment;
"4. The maintenance and regulation of fire-escapes;
"5. The means and adequacy of exit in case of fire, from factories, schools, hotels, lodging houses, asylums, hospitals, churches, theaters, and all other places in which numbers of persons work, live or congregate from time to time for any purpose;
"6. The investigation of the cause, origin and circumstances of fires."

To reduce the above definitions to simple terms, in general, it is the function of the city building department to concern itself with structural conditions which may affect the spread of a fire through a building, and it is the function of the fire prevention bureau to concern itself with the probable causes of fires in a building.

There is no exact line of demarkation between these two departments, and in order to secure any sort of efficiency, particularly in a large city, cooperation between the fire prevention bureau and the building department is absolutely essential.

Cooperation in Milwaukee

I recommend the organization chart of the Bureau of Building Inspection prepared by Building Inspector Gurda of Milwaukee for investigation. The Department of Buildings in Milwaukee is divided into seven major divisions, one of which is the Division of Combustibles and Fire Prevention Inspection. This division makes inspections of such occupancies as public garages, film exchanges, dry cleaning establishments, gasoline service stations, flammable liquid bulk storage plants and all other buildings where the manufacturing process requires the storage or handling of hazardous materials or flammable liquids; emphasizing, of course, the structural and maintenance angles of these properties to eliminate possible fire hazard. The Fire Prevention Bureau in Milwaukee also makes inspections of this type of property in the course of its activities. In an address at the annual convention of the National Fire Protection Association last spring, Chief Hackett of the Fire Prevention Bureau said the following:

"Last year we sent 2,563 reports of violations to the Building Inspector's Department, and all were remedied. A great deal of credit must be given to our City Building Inspector for the help he has given our Bureau. As a matter of fact, cooperation among the various departments, and that received from the general public, is the keynote of successful fire prevention work."

For the Smaller Municipalities

Only the reasonably large cities have definitely established fire prevention bureaus in their fire departments. We should give some attention to the situation in the smaller city and town where perhaps the building department is made up of only one man, the building inspector, and the fire inspection work is done by one man, the fire chief. While it is perhaps obvious, I think it needs to be pointed out that a building inspector, because of his position and the necessary background he must have before receiving his appointment, should be a better general inspector than a fire chief. Inspection work is not the prime function of a fire chief, and the chief is usually not selected with this in mind. In the smaller towns, therefore, where the situations above described exist, I should personally favor that the bulk of the fire prevention inspection be handled by the building inspector rather than by the fire chief, and I am certainly opposed to the idea of consolidating the building department with the fire department wherever it can be avoided.

PERCY BUGBEE,
Assistant Managing Director, National Fire Protection Association.

* From a paper before the Building Officials' Conference of America, held in Boston, April 26, 1934.

Policemen Analyze Their Jobs

POOLING experience is one way of learning more about your business, police officers of Oklahoma believe. Forty of them, representing 197 years of police experience, held conference recently at Ardmore, Okla., to exchange views on catching criminals and the preservation of law and order.

The leader of the round-table was the state supervisor of trade and industrial education, but the instructive information used came from the officers who participated in the school. This material, together with results from four or more "job analysis" conferences scheduled for other cities of the state, will be used in developing a comprehensive, practical training school program as a permanent feature of police work in the state.

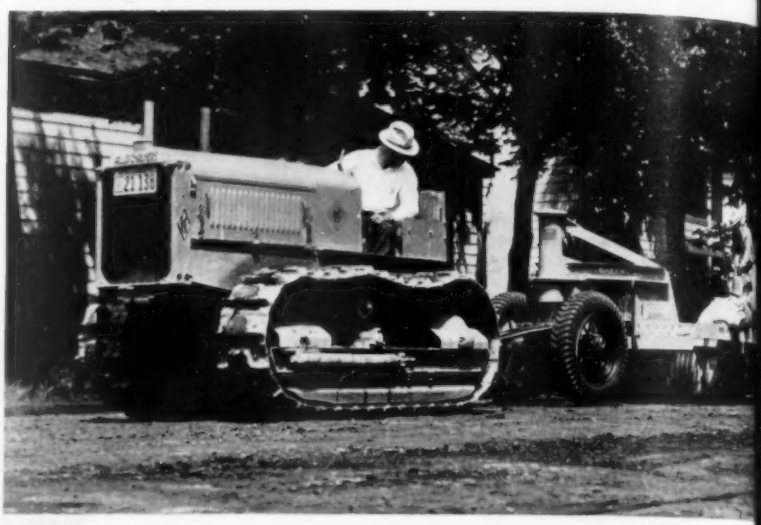
Los Angeles police officers a year ago made careful studies of their jobs, and a bulletin on job analysis of police service—what a policeman should know—was published by the State Department of Education.

In addition to Oklahoma, a number of other states have recently held police training schools. Ohio's first crime school, held at the State University in March, brought together police officers from the entire state. Michigan police attended four series of lectures arranged on alternate Mondays of March and April this year at the University of Michigan. California, Colorado, Kansas, Minnesota, New York, Texas, Virginia and Wisconsin are among other states which hold schools for their policemen.

Park and Street Maintenance

Sacramento, Calif.

Here is one way to keep an oiled street smooth and free from bumps. The City of Sacramento used this "rut and bump eliminator" behind its new Allis-Chalmers Model "K" tractor. The "K" supplies smooth, steady power, permitting the hydraulic controlled discs to do their best work. . . . Its 48 horsepower is ample for many other city jobs . . . all year long. Two important facts are coming to light these days in more and more cities. . . . (1) Oiled streets are easily made at low cost. (2) Allis-Chalmers tractors and equipment are best for keeping these streets in A-1 shape.



La Crosse, Wis.

La Crosse is another city that has most of its streets paved with an oil mat. The City purchased an A-C Speed Patrol to keep the streets in smooth condition. This Patrol is scarifier equipped so that the oil mat may be ripped up and reworked whenever necessary. In winter, a "V" blade snow plow is attached to the Patrol to keep the streets well cleaned.

For Your City

Cities with electric or telephone lines to erect or keep in repair will be interested in equipment that saves time and reduces danger. This pole setter and post hole digger for the A-C Model "K" shortens the time necessary for digging holes . . . and lightens the job of raising and setting poles. . . . There are many types of time and money-saving machines designed for use with Allis-Chalmers tractors. . . . You are invited to write Allis-Chalmers for information about equipment which will save money for your city.

You will like the ACTION magazine. Ask for it.

ALLIS-CHALMERS
TRACTOR DIVISION—MILWAUKEE, U.S.A.

JULY, 1934

Vol. XLIX, No. 7

The American City

470 Fourth Avenue
New York

35 Cents, $2 a Year

THE AMERICAN CITY advocates:

An abundant supply of clear, safe, palatable water

Streets and roads that are well built, well lighted, well maintained

Sanitary disposal of sewage and garbage

Fire and police departments properly trained and equipped

Traffic control for safety and facilitation; fewer grade crossings

Plenty of parks, parkways, playgrounds, and swimming pools

Banishment of slums, and building of well-planned home neighborhoods

Administrative efficiency and citizenship co-operation in bringing these things to pass

Public Works Provisions of New Legislation Utterly Inadequate

IT will apparently be a waste of time for local officials to submit to the Federal Emergency Administration of Public Works, prior to the next session of Congress, new requests for loans or grants for public works projects. This is made clear in the following letter, dated June 21, 1934, written to the editor of THE AMERICAN CITY in behalf of Administrator Ickes, by Michael W. Straus, Director of Press Relations of PWA:

"This is to acknowledge receipt of your letter of June 20 in which you ask for an authoritative statement as to the proper procedure to be followed by municipal officials desirous of obtaining loans or grants from public works funds recently appropriated by Congress.

"You are correct in assuming that approximately $500,000,000 will be allocated to PWA from funds authorized in the Deficiency Bill. This will not be sufficient, however, to come anywhere near meeting the requests for funds as represented by pending applications. We have on hand perhaps $3,500,000,000 in applications from municipalities and other non-Federal public bodies. There also are pending from various Federal departments and agencies applications aggregating more than $1,000,000,000.

"The Administrator instructed state engineers last February to discontinue acceptance of new applications and to send all pending applications to Washington with their recommendations. Even after the original $3,300,000,000 fund was exhausted by allotment, the legal, finance and engineering divisions in Washington continued to examine projects in order to have them ready when Congress authorized a new appropriation. Within a very short time these allotments will be made and announced. There is not sufficient money, however, to enable the Administrator to invite any new applications for loans and grants."

Two courses of action—both of which merit prompt and vigorous action—are open to municipal and county officials whose hopes for early Federal aid are dashed by the foregoing letter:

(1) It is not too early to begin the building-up of public sentiment throughout the United States which will demand and secure from the next session of Congress a public works appropriation adequate for the emergency which still exists. While there has, of course, been a marked improvement in employment conditions since the inauguration of the "New Deal," the number of workers still unemployed in the United States is estimated by the National Industrial Conference Board (for May, 1934) at the distressingly large total of 7,899,000. It is unthinkable that an intelligent democracy will prefer to continue supporting this tragic army of disheartened men and women by relief doles rather than by the useful, self-respecting jobs which public works and services could readily provide.

(2) As THE AMERICAN CITY said last month, notwithstanding our recognition of the urgent need for adequate Federal appropriations for local public works, we are convinced that many local officials are failing to play their proper part in the campaign for national recovery. There are, of course, many efficiently managed municipalities and counties throughout the United States with ample margins of taxing or borrowing power to finance their maintenance and construction needs without Federal aid. Failure of local officials to take a vigorous affirmative stand in this matter has resulted from the activities of shortsighted taxpayer groups who have become much more vocal than their more forward-looking fellow citizens. Unless determination to render fundamental public service overcomes the fear of criticism in such cases, public properties and real estate values will continue to deteriorate—and the restoration of employment and prosperity will be needlessly delayed.

Competitive Bidding for Municipal Audits

A Regrettable Practice

By **LLOYD MOREY**

Chairman, Special Committee on Governmental Accounting, American Institute of Accountants; Vice-Chairman, National Committee on Municipal Accounting

THE movement to improve the accounting practices of American municipalities undertaken by the National Committee on Municipal Accounting, with the cooperation of national organizations of professional accountants and municipal officers, is being pushed forward so rapidly that it seems likely the accounting and reporting of cities in this country will soon be placed on a sound and businesslike basis. A notable achievement of the National Committee is the preparation and wide circulation of a "Suggested Procedure for a Detailed Municipal Audit." This step was taken partly as a means of mitigating the evils of one of the most regrettable practices in the conduct of the fiscal affairs of cities—the selection of auditors on the basis of competitive bids.

The Audit a Necessary Protection

The arguments for the audit of a municipality by an independent public accountant are not subject to contradiction. Laws and custom attest the fact that this safeguard against inefficiency and dishonesty is universally recognized in the industrial world. Government really is our largest industry, and the taxpayer bears the same relation to the administrators of his government that the stockholder bears to the management of a corporation. He is entitled to the same protection of his interests. Furthermore, investors in municipal bonds are demanding the same measure of protection accorded the purchasers of industrial and other securities. Without question, the day is near when the report of a public accountant on the soundness of a municipal issue will be considered as necessary as an attorney's statement of its legality.

It is unfortunate that a community that is aware of the imperative need of a periodic check on the fiscal affairs of its government should so often, through the unwise selection of an auditor, lose all benefit of an independent investigation. Indeed, not only is all benefit often lost, but sometimes definite injury is done. The report of an auditor who secured his engagement simply because he was willing to accept the least compensation is likely to leave citizens and municipal officers alike with a false sense of security which may lead to tragic consequences. It is ironic that the rejected higher bidders are in most instances those who contemplate the most thorough and painstaking audit, whereas the lowest bidder is often prepared to undertake only the most summary review and superficial check.

Professional Organizations of Accountants Disapprove the Practice

The American Institute of Accountants and other professional organizations of accountants are united in emphatic disapproval of the practice of bidding in competition for engagements. They have opposed it on the grounds that it is subversive of the high standards of ethical conduct and technical proficiency which they are constantly striving to maintain. The Institute recently published a pamphlet entitled "Audits of Governmental Bodies," prepared by a special committee on governmental accounting, in which the dangers of competitive bidding were emphasized. And yet in combating this recognized evil, a great handicap often is the requirement of the law.

Standard Audit Procedure

Until the statutes of governmental units are amended to omit the requirement that auditing work shall be submitted to bidding, the most effective means of attacking the problem appears to be the promotion of a standard audit procedure such as that recently promulgated by the National Committee. In every instance where bids must be called for because of such requirement, it is earnestly urged that this standard procedure be used as the basis of all negotiations prior to the awarding of the contract. The door may thus be closed against those who would make a high profit from a low bid by performing a perfunctory investigation which, though it is little more than a gesture, the low bidder will still unblushingly call an audit.

It is encouraging to note that the cooperative efforts of accountants and municipal officers to place municipal accounting on a higher plane are bearing fruit. Recently a member of the Board of Apportionment and Taxation of Bridgeport, Conn., read from the aforementioned pamphlet of the American Institute of Accountants in opposing a proposal that the contract for auditing the tax collector's records be submitted to bidding. In the course of the debate, it was brought out that an earlier audit contract which had been awarded as the result of bids had entirely failed in its purpose. The Board finally decided to award the contract without bids to a firm of professional accountants which had performed the engagement satisfactorily in past years.

A bureau of accounts recently established by the Florida League of Municipalities now offers its services to cities in making preliminary surveys and preparing audit programs on the basis of which auditors may then be engaged. Its chief accounting officer, Walter Mucklow, is a member of the Governmental Accounting Committee of the American Institute of Accountants which is participating in the work of the National Committee.

It is the coordination of the efforts of the many now engaged in this task, exemplified in the instances just cited, that leads one to believe that the movement will go inevitably on until the fiscal affairs of cities are based on sound accounting principles and subject to periodic review by a public accountant of recognized professional standing and ability.

Starting the Operation of the Water Purification Plant of Marion, Kentucky

By JACK J. HINMAN, JR.

**Associate Professor of Sanitation,
University of Iowa,
Iowa City**

UNTIL recently the city of Marion depended upon a water supply taken from an old shaft in a fluorspar mine. As Mayor J. V. Threlkeld, of Marion, said, the water was hardly acceptable even for putting on a fire, so the public made little use of it except for flushing. They did not drink it generally, but preferred the less mineralized water of their cisterns and shallow wells. Although the city supply had been available since 1925 through a general distribution system including a 150,000-gallon elevated tank, the daily pumpage was only about 20 gallons per capita.

Marion is a community of nearly 2,000 people in northwestern Kentucky. It is the county-seat of Crittenden County. The mining of fluorspar is an important local industry, and the product is shipped away to be used as a flux and electrolyte in steel and aluminum works. The coal mines of western Kentucky are near at hand. Agriculture is the most obvious surface activity. Marion is fortunate in having beautiful homes, fine schools and an intelligent and hospitable citizenry. Naturally the community wanted a water supply which would be suitable for all the purposes that modern city life involves. Especially they wanted a good water for drinking and other domestic uses.

With the help of funds supplied chiefly by the Reconstruction Finance Corporation, the people of the city of Marion have recently attained their desire. They called in the firm of Howard K. Bell, consulting engineers, of Lexington, Ky., to design and supervise the construction of the proposed water-works improvements. This firm had designed the distribution system and elevated tank installed in 1925. The firm of Cole and Moore, of Paducah, Ky., was selected as the contractors for the actual construction. H. Cable Cramer acted as resident engineer for the designing engineers. Work was started promptly and carried through rapidly.

Funds for the project were secured as a loan of $35,000 from the Reconstruction Finance Corporation. The cost of the filtration and pumping plant was $16,500, including engineering charges. The dam and land cost $12,000 and the balance of the loan was spent on 6,500 feet of 8-inch pipe line, roads and other minor work. In addition to the RFC loan, approximately $6,000 derived from CWA and direct Federal relief funds was applied to roads, culverts, grading and general beautification of the site.

The new water plant was put into service on January 23, 1934, and by February 16, after an extensive flushing of the system and collection of water samples from the dead ends of the mains, the laboratories of the State Department of Health pronounced the water satisfactory.

The Source of the New Supply

Plans for the new water works included both a new source of water and a new purification plant, together with the necessary pumps and pipe line to deliver the treated water into the existing distribution system. A site for a

GENERAL VIEW OF THE FILTER PLANT FROM THE SOUTH, SHOWING WASH-WATER TANK ON THE ROOF OF THE PLANT, AND THE SETTLING BASIN IN THE REAR OF THE BUILDING

reservoir was chosen about two miles southeast of the city where it was possible to throw a dam across a small stream called Crooked Creek. The dam was planned to be of the earth-fill type with a concrete core and a cut-off wall into the underlying sandstone. A concrete spillway and apron were provided to deliver the excess water into the rocky bed of Crooked Creek. The core wall and spillway were designed to permit the raising of the elevation of the water surface of the reservoir some 6 feet. The main body of the dam was intended to allow such raising of the water level for 4 feet without the necessity of adding to the fill. The upper surface of the dam was paved with rock in order to prevent damage from wave action and other destructive forces. A 16-inch blow-off pipe, valved at the upper and lower ends, was inserted through the dam to permit the draining of the lake or the wasting of undesirable water from the depths of the reservoir.

Delivery of the water from the lake to the treatment plant is accomplished through an 8-inch pipe. Most of the time the water from the reservoir will be delivered to the plant by gravity, but a 300-gallon-per-minute raw-water pump is available to take care of occasions when the lake may be drawn down to such a point that the water will not flow of itself to the filter plant. The intake of the 8-inch delivery line is a screened and swiveled pipe moving upon a wheeled carriage traveling in an arc. This carriage may easily be lowered to various depths by hand. It may also easily be drawn up out of the water for cleaning or repairing the screen.

The watershed contributing to the reservoir is approximately 2,700 acres in extent, and the water area, when the lake is filled to the level of the crest of the spillway, is about 15 acres. The estimated capacity of the reservoir is nearly 20 million gallons.

A secondary dam has been built across Crooked Creek about 800 feet downstream from the spillway of the reservoir. This serves to create a pool from which water may also be drawn by the raw-water pump.

The Filter Plant

The treatment plant consists of a brick building of simple and attractive design, with a circular sedimentation basin connected to it by an uncovered walkway. On the roof of the building is a steel tank of 9,000 gallons capacity which serves for the storage of the water to be used in washing the filters. The building is located about 1,000 feet from a roadway in a partially wooded area with a by-road leading up to it and beyond toward the reservoir. A considerable amount of effort has been expended with CWA labor toward the beautification of the immediate surroundings.

Raw water from the reservoir on Crooked Creek is delivered to the mixing basins of the filter plant through the 8-inch pipe from the screened intake. The mixing basins consist of a series of channels containing wooden baffles combining the action of around-the-end and over-and-under types. They are located at one end of the filter building and over the pump room of the plant. Chemicals may be introduced at several points in the mixing basins by means of three Omega dry-feed machines. It is planned to feed aluminum sulfate, hydrated lime and activated carbon with this apparatus. The mixing basins have a capacity of about 15 minutes flow at 300 gallons per minute.

From the mixing basins the water passes to the circular sedimentation basin outside the filter building. This basin is 30 feet in diameter and 12 feet deep. There is a single around-the-end baffle. Water is admitted through a series of rectangular ports in rows one above the other on the south side of the baffle. The effluent passes over a weir into an 8-inch pipe which takes it to the filters. A walkway is located over the central baffle and is continued across the basin. It serves excellently as a place from which to observe the water in the basin during subsidence of the floc and other suspended matters. The basin is designed to hold some three hours' pumpage at the rated capacity of the plant. At the initial rate of consumption by the city this amounted to more than 24 hours' demand.

There are two filters to which the coagulated and settled water is delivered. They are of the rectangular concrete type of gravity filter units. Each filter has an area of sand bed of a little more than 78 square feet, which makes its capacity, at the customary rate of 2 gallons per square foot per minute, slightly more than the required 150 gallons per minute necessary to give a plant capacity of 300 gallons.

The underdrain system of the filters makes use of a special modification of the Ira H. Jewell filter bottom that has been improved by the designing engineer. A few inches above the bottom of the filter tub rests a false bottom composed of a series of specially cast concrete blocks whose upper surfaces are covered with inverted pyramidal recesses about 7 inches square and 6 inches deep. A $\frac{3}{8}$-inch brass pipe at the tip of each pyramid communicates with the space below the special blocks. Over the top of the brass tube is placed a glass deflector to divert the direct upward flow of the wash water when a filter unit is being cleaned by reverse flow. This diversion of the flow is desirable in order to prevent channeling of the gravel and sand of the filter bed during the washing operation. The space in the pyramidal cell above the glass deflector is filled with large gravel of 2- and 1-inch size, hand placed, with the finer material at the top of the cell. The filter bed itself is composed of a supporting bed of graded gravel on which rests 26 to 28 inches of Ottawa filter sand. A very uniform flow of wash water is obtained with this type of underdrain system.

With the exception of the wash-water valve, all the valves for the operation of the filters are placed in the basement of the plant, as an economy measure. All valves are manually operated. Wash water for the filters, coming from the 9,000-gallon tank on the roof of the plant, enters the filter building through a vertical pipe and the flow is controlled by a valve in this vertical pipe. The valve wheel is so located that the valve opening may be adjusted by the operator while he is observing the action of the wash-water flow upon the agitation of the bed of filter sand.

Novel Scheme for Insuring Clear Water

The filtered water is delivered into a well or surge tank in which is located the suction pipe for the high-service pumps. This surge tank, which is 3 feet square in plan and about 13 feet deep, carries about 10 feet of water when the filters are not operating and the valves are open. The bottom of the surge tank was a white tile background with letters of black tile upon it. Near the top of the tank is a shaded electric light casting its rays down into the water. Over the top of the surge tank is a sheet of plate glass set in a metallic frame. The tank is intended to serve as a

combined loss of head gage and sight well. As the filters become dirty and greater resistance is offered to the passage of water through the sand, the constant removal of the filtered water by the high-service pump produces a draw-down in the surge tank. An aluminum ladder going down into the surge tank helps the operator to obtain a rough idea of the amount of resistance, since the rungs of the ladder are equally spaced. The operator can also obtain information as to the efficiency of filtration by looking down into the surge well and noting how plainly the markings at the bottom can be seen. A very small amount of turbidity or color can be observed in such a piece of apparatus. At no time during the first month of operation of the plant was the bottom of the surge tank obscured. The inscription, "Bell 1933," remained clearly legible throughout this period.

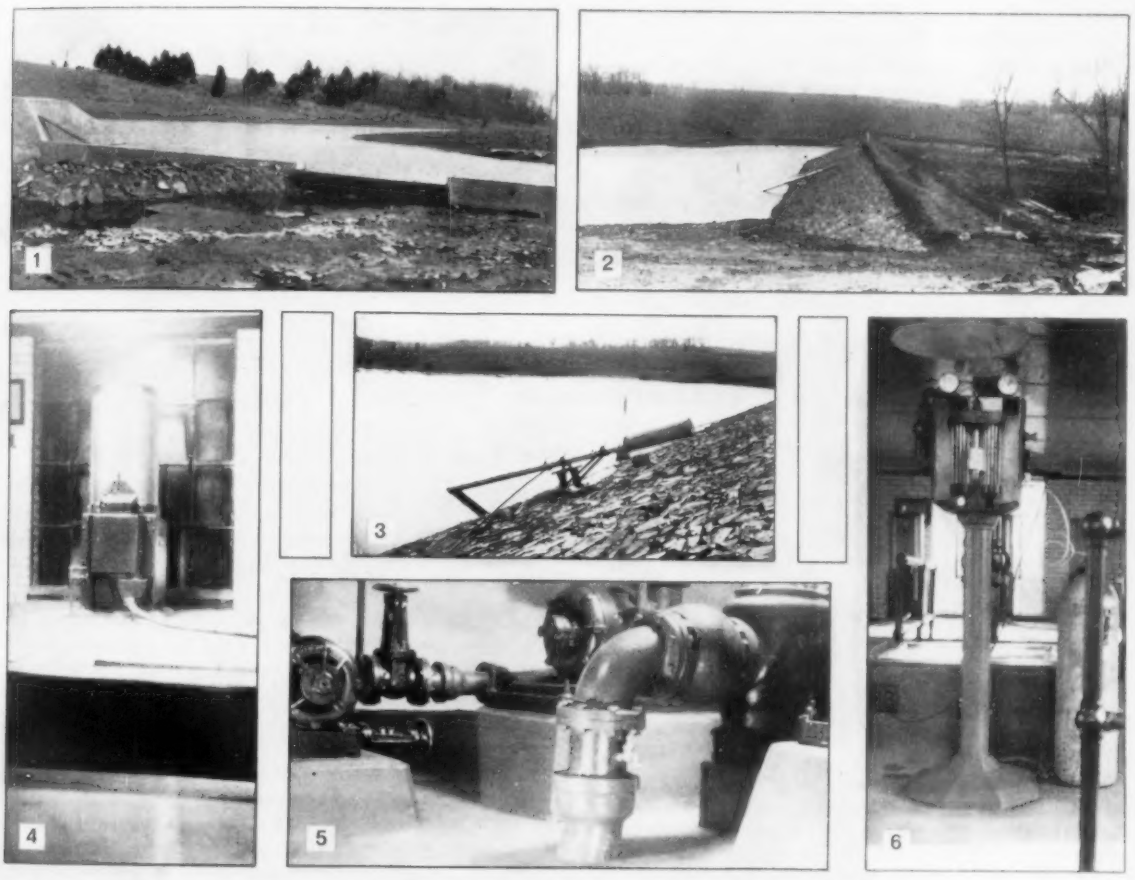
The effluent of the filters is chlorinated as it enters the surge well. A Wallace and Tiernan chlorinator of the MSP type is installed for this purpose.

Two single-stage centrifugal pumps, direct-connected to electric motors, are used to pump the treated water to the city of Marion. The capacity of each pump is about 300 gallons per minute against a head of 100 pounds per square inch. A 6-inch Badger meter is in use as a master meter to measure the output of the purification plant.

Plant Capacity Permits Short Day

It will have been noted that the capacity of the filter plant is such as to permit the quantity of water used by the city each day to be pumped from the filter plant to the distribution system within a period of approximately three hours. This permits the man in charge of the operation of the plant to give a substantial proportion of his time to the reading of meters, making of taps, and such other duties as are desirable for him to undertake in connection with the work of the Water Department. A considerable period of time probably will elapse before daily operation for as long as eight hours will be necessary, although with the natural increase in use of the city water supply which is certain to follow appreciation of a satisfactory water, the pumpage rate will undoubtedly mount rapidly.

A certain amount of laboratory control work is provided for by the installation of a laboratory bench with a sink and the necessary apparatus for simple routine tests. Bacteriological examinations of the plant effluent are expected to be made at frequent intervals by the laboratories of the State Department of Health and certified to the



THE NEW DAM AND FILTRATION PLANT AT MARION, KY.

1. A view of the partially filled reservoir from the spillway. 2. The upstream face of the dam, showing the rock-paved surface and the intake pipe drawn out of the water. 3. A close-up of the screened intake pipe as shown in illustration 2. 4. The top of the mixing basins, with the Omega dry feed machine in position. 5. A section of the pump room, showing the master meter at the right. 6. The W & T chlorinator, with the surge well immediately behind it

local officials by the State Sanitary Engineer of Kentucky.

Starting the Plant

The contractors and the engineers had entered into an arrangement with the city of Marion which required the plant to be started and operated for a period of a month by an experienced water-plant operator. During this period the man selected was to see that the equipment was in suitable condition and functioning properly, to calibrate the chemical feed machines and to instruct the local operator chosen by the city officials.

Upon an inquiry sent by the engineers to the writer, he suggested the scheme of employing the senior graduate student operator at the University of Iowa water-works plant for the operation of the Marion plant during the initial period of a month. It was suggested that the young man be given a leave of absence from his duties at the University plant and that the writer bring him to Marion, get him oriented properly in the new work and then leave him to complete the period of a month as provided in the agreement. The proposal met with the approval of those concerned and was duly carried out.

Performance of the Plant

The operation of the water purification plant designed for the city of Marion offered no especially difficult problem in water treatment. The equipment was complete and adequate. The alkalinity of the water was low, from 40 to 50 ppm. The turbidity was only about 25 ppm and was quite constant. There was little, if any, annoyance from growths of algae at the time of beginning operation. Nevertheless, experienced water-works operators will appreciate that there were details which needed to be worked out in the treatment of the water, for each water supply has characteristics of its own that must be learned and conquered, even if they are ever-changing. That ever-changing character of water supplies is one of the chief things that make water-supply work so interesting and so challenging to a man's understanding and ability.

Visitors Invited

As was to be expected, the fact that the new water plant was in operation aroused much interest in the new water supply among the people of Marion. They were given to understand that they were welcome at the plant. Pictures, signs and demonstration material were placed where they could be inspected. Classes from the schools were taken through the plant and its functions were explained carefully to the students. Finally a formal opening was arranged for the afternoon of February 4, 1934, the public were invited to attend and more than 200 people did come.

Right of Tax Authorities to Compel Production of Corporate Books

THE question of the right of tax authorities to compel the production of books and other documents for the purpose of revealing the ownership of property, has been before the courts in a number of well-reasoned cases. And the right has quite generally been upheld; for example:

In *Coco-Cola Company v. Atlanta*, 152 Ga. 558, the city of Atlanta sought to compel the defendant company to permit inspection of its books for the purpose of disclosing the ownership of its stock. In granting the right, the Court reasoned:

"The purpose of the petition in this case is to uncover properties alleged to be liable for taxes. * * * Discovery is a favored jurisdiction of equity, and it will not be denied when the effect of such denial will be to defeat public justice, unless the plain letter of the law so demands. That the relief prayed for is within the letter of our law, as well as its spirit, we entertain no sort of doubt."

So too, in *First National Bank v. Hughes*, 6 Fed. 737, the Court reached a similar conclusion in upholding the right of tax authorities to compel a national bank to produce its books. The Court said:

"The complainant [bank] insists * * *, that the proposed enforced exhibition of its books will expose its business, lessen public confidence, diminish its deposits and consequent profits, and impair the value of the franchise. We fail to see any sufficient reason for such grave apprehensions. But if complainant's fears were well founded, the state might still be entitled to the testimony demanded. Private rights must to a reasonable extent yield to public necessities * * *."

And in *Baker v. State*, Supreme Court of Indiana, 108 N. E. 7, the Court, in upholding the right of a grand jury to question a bank cashier as to depositors and amounts deposited, in part said:

"In this case the return shows that the Grand Jury had information that would naturally lead it to believe that some of the taxpayers of the county had made false tax returns as to the amount of money on hand, * * * and that some of such taxpayers had committed perjury in swearing to the assessment sheets containing lists of their taxable property. For the purpose of ascertaining who, if anyone, was guilty of one or the other, or both, of such offenses, the Grand Jury had a right to interrogate appellant [cashier] concerning the deposit of H.G.B. or of any other taxpayer of the county."

The foregoing decisions are in accord with the great weight of authority on the question here involved. And, in the light of their holdings, it is clear that, in the absence of a constitutional or statutory inhibition, tax authorities have ample power to compel the production of books and records for the purpose of uncovering the ownership of property in order that it may be placed on the tax lists. The expediency of such action will, of course, always rest in the sound discretion of the tax authorities.

LESLIE CHILDS.

Can Your City Accept the Gift of a Concert Organ?

A LETTER recently received by THE AMERICAN CITY says:

"I have liquidated all my school equipment except the largest of my organs, a $25,000 three-manual Wurlitzer, built in 1928. I will donate this instrument to a city with a suitable municipal auditorium agreeing to use it for free concerts for the general public. The offer includes cities with suitable space for this purpose in museums."

(Signed) VERMOND KNAUSS.

The Vermond Knauss School of Organ Playing, 210 North Seventh Street, Allentown, Pa.

The Operation of the Chicago Incinerator

By LEONARD P. TURNER

**Superintendent of Dumps and Incineration,
Bureau of Streets,
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THE Chicago incinerator is probably one of the largest in the country, its capacity being 600 tons daily. The site is on the river front, surrounded by industrial plants, and the building is generally pleasing in appearance, with well-kept lawns and drives, giving it distinctive surroundings. The ground area of the plant is 265 feet by 380 feet. The building is 172 feet wide by 125 feet deep, with an attached office and workroom 18 feet by 40 feet. Constructed of concrete and steel, the building is faced with brick trimmed in Indiana limestone.

There is a tipping floor for trailers and trucks, measuring 13 feet wide by 172 feet long, leading to the storage pit. There are five entrances and one exit for the unloading platform. The tractor units enter on one side and leave on the other. The four front entrances are used for trucks which back in. The storage pit has a capacity of approximately 1,200 tons.

Operation of the Collection Trucks and the Incinerator

When the trucks and trailers enter the grounds, they stop at the scale house, and the truck and load is weighed. They are then driven to the tipping platform and emptied into the storage pit. The refuse is picked up by electrically operated cranes, lifted to the top of the furnace and unloaded into hopper holes, where it is fed by one man into the furnaces.

There are four 1-cubic-yard hopper holes on each furnace, and each has a sliding door leading into the furnace, operated by compressed air and controlled by a pull chain, handled by a stoker on the firing floor. When he releases the sliding door, the refuse in the hopper hole drops into the furnace.

There are six such furnaces, each 29 feet by 16 feet outside measurements. Each furnace has three baffle walls, five clinker walls, and 135 square feet of grates. There are eight doors on each furnace, four in front and four in the rear. The combustion chamber areaways are 39 feet long, 6 feet wide and 11 feet high. The furnaces are of 100-ton capacity per 24 hours, the burning average being about 4 1/6 tons per hour.

The furnaces are operated by forced draft, generated by electrically controlled motors through a pre-heater. There is one motor of 15 horsepower, operating at 1,800 revolutions per minute, for each furnace. The cold air from the outside is blown into the pre-heater and thence into each furnace. The blow-fan not only draws in cold air from the outside but also blows out warm air. The average preheat runs from 350 to 500 degrees. The burning heat in the combustion chambers averages from 1800 to 2300 degrees. When an even temperature is maintained, the burning power is increased.

The furnaces are cleaned every four hours, and the ashes and cans are dropped into hoppers located under the furnace in the ash basement. The ashes are loaded into carts and carried to a skip-hoist, then lifted and emptied into a large storage hopper, from which trailers and trucks are loaded and carry the ashes to various dumps. The ashes in the hopper are moistened by water sprays controlled by an electric booster pump. This eliminates dust when loading the disposal trailers.

There are three 10-horsepower suction fans which draw dust from the ash basement and transfer it to collectors. There are also two compressors, one 50-horsepower and the other 30-horsepower, used for furnishing the air to operate the sliding hopper doors and cleaning of flues.

Except when the garbage is very wet, little coal is used.

Operating Statistics

The incinerator began operating in July, 1928, and has served the north half of the city since that time. Noncombustible refuse in this section is either disposed of by dumping or carried away by railroad.

Operating statistics of the Superior incinerator for 1928 through 1932 are given in the following table:

Year	Tonnage Incinerated	Tons Coal Used	Cost of Incineration	Per Ton Cost	Per Cent Residue	Remarks
1928	46,516	2,389	$133,081	$2.86		Contract operation
1929						
Jan. to March..	16,217	808	45,842	2.826	14.8	Contract operation
April to Dec...	80,189	722	149,849	1.87	17.5	City day labor
1930	75,240	470	183,356	2.49	19.05	City day labor
1931	79,713	579	178,421	2.24	18.75	City day labor
1932	83,224	702	162,355	1.95	17.3	City day labor

(Refuse delivered to the incinerator averages about 365 pounds per cubic yard.)

The tables below show the number and class of employees operating the incinerator during the periods indicated:

Day shift, 8 A. M. to 4 P. M.:
- 2 junior clerks
- 1 plant foreman
- 1 electrical mechanic in charge
- 4 electrical mechanics
- 3 motor truck drivers
- 3 helpers on trailers
- 12 men feeding furnaces (two men to each furnace)
- 12 men stoking furnaces (two men to each furnace)
- 2 men on tipping floor
- 4 men in ash basement
- 1 man to operate ash hopper
- 1 man to do general greasing

46 total

Night shift, 4 P. M. to 12 midnight:
- 1 junior clerk
- 1 plant foreman
- 4 electrical mechanics
- 12 men feeding furnaces (two men to each furnace)
- 12 men stoking furnaces (two men to each furnace)
- 4 men in ash basement
- 1 man on miscellaneous assignments

35 total

Midnight shift, 12 midnight to 8 A. M.:
- 1 plant foreman
- 4 electrical mechanics
- 12 men feeding furnaces (two men to each furnace)
- 12 men stoking furnaces (two men to each furnace)
- 4 men in ash basement
- 1 man on miscellaneous assignments

34 total
115 grand total

ACKNOWLEDGMENT.—From a paper presented before the International Association of Public Works Officials.

A Method of Testing Highway Guard-Fence

By P. J. FREEMAN

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IN THE early days of horse-drawn vehicles, some thoughtful person placed long poles or rails at dangerous spots along the roadways and thus made the first highway guard-rail.

The term "guard-rail" is used by many engineers to mean any type of barrier which may be erected along the side of a road to prevent a vehicle from leaving the roadway. In a report made in 1931 by a committee of the American Road Builders' Association, the term "guard-rail" includes earth embankments, boulders, wooden posts, planking, logs, wire cable, woven wire, steel bars, reinforced concrete and metal plates. The term "highway guard-fence" is commonly applied to cable railing, but this term has less general application than guard-rail.

Combinations of rails or planks were quite adequate for the protection of early users of automobiles, and no serious attempts were made to improve the construction of such guard-rails until the roads and turnpikes became paved highways and the speed of automobiles had increased considerably.

In sections of the country where the topography was such that the damage to occupants and vehicles might be very serious on account of leaving the roadway, heavy embankments were built, and in some cases stone or concrete walls were erected. In other cases, heavy wooden posts were placed firmly in the ground at close intervals. The entire thought in the mind of the builder of such guards was to keep the vehicle from leaving the roadway. Little or no thought was given to the amount of damage to the vehicle in case of accident, the sole object being to keep the vehicle on the right-of-way.

In some localities discarded mine cable was used with quite satisfactory results, but such material deteriorated rapidly from corrosion, and specially designed wire rope was developed which could be heavily galvanized. These ropes or cables all passed through the body of the post, which made the work of repairing damaged railings difficult, and the posts were also subjected to a splitting action in the case of an accident.

THE EFFECT OF A 4,450-POUND AUTOMOBILE TRAVELING AT 30 MILES PER HOUR AND HITTING A HEAVY-GAGE FLAT STEEL PLATE TYPE OF GUARD-FENCE

THE RUNWAY AND A SECTION OF PANEL TYPE GUARD-RAIL READY FOR TEST

It is the purpose of this paper to review the history of the testing of highway guard-rail, and also to describe briefly the results obtained in a recent series of tests made under the supervision of the writer during the summer of 1933.

Up to the time of the development of the first highway cable guard-fences there appear to have been no attempts to determine the comparative efficiency and effectiveness of any of the types of barriers in use. Generally speaking, the guard-rails constructed of wood were built in accordance with the ideas of the individual responsible for their construction, and the need of investigation for the best design was not felt until the construction of guard-fence of cables had reached a moderate amount.

Early Tests on Wire Rope Highway Guard-Fence

The first published report of tests of highway guard-fence with which the writer is acquainted is given in a paper by H. S. Mattimore before the eighth annual meeting of the Highway Research Board of the National Research Council. This report, on "Guard-Fence Research," gives the details of the development of wire rope highway guard-fence and describes a number of tests made by the Pennsylvania Department of Highways.

The first series of field tests was started in 1924 by the Pennsylvania Department of Highways in conjunction with the United States Bureau of Public Roads, and the Pennsylvania Department of Highways has continued to make these tests at intervals ever since that time. An inclined wooden runway was constructed on an 8.5 per cent grade with rails to keep the vehicle from leaving the runway. Trucks and automobiles were allowed to coast down the runway and strike the guard-fence which was built at the bottom of the runway at different angles. The early tests demonstrated quite effectively that a guard-fence must be built along the line followed by the Deacon in building

his famous "one-horse shay"; that is, all parts of the cable fence from anchor to anchor must be equal in strength if the design is to be effective.

It was found that the concrete deadmen had to be thoroughly fixed in the ground and the backfill properly placed. It was demonstrated that the most effective way of doing this is to dig a hole for the deadman and cut a notch through the earth for the anchor without disturbing the stability of the ground at that point. This construction is familiar to all engineers who are accustomed to placing reinforced deadmen in the construction of highway guard-fence. Early in the program it was recognized that the capability of a highway guard-rail to stop a vehicle was governed by the stability of the end anchorages, and they were given first consideration.

It was found that it was necessary to reinforce a concrete block or the anchor bolts would be pulled out, owing to the failure of the block. Through additional tests it was demonstrated that if wire rope is used for the end connection between the posts and the deadmen, it should be one inch in diameter. This end anchorage was also developed to use turnbuckles and heavy bolts in place of wire rope, largely as a matter of ease in construction.

A satisfactory reinforced concrete anchorage having been established, it was then found that the eye-bolts used for holding the cables to a heavy end post failed because they were welded. These were replaced with drop forged eye-bolts.

It was demonstrated that if the cables passed through the posts, and the cables did not break, the posts were pretty certain to be split, and also the vehicle came in direct contact with the post, causing severe damage to the vehicle. These tests also showed that, in general, the top rope received the greatest impact and the substitution of a 1-inch top rope for a ¾-inch rope greatly increased the value of the guard-fence, for a small additional cost. A later development consisted in placing the cable on the outside of the post, where it was held in contact with a light hook-bolt. This tended to eliminate the splitting of the posts and also greatly facilitated making repairs, but the vehicle was still likely to come in contact with the posts, causing severe damage.

A metal offset block was placed between the cable and the post and held in place with a hook-bolt. Tests of this design demonstrated that fewer posts were torn out or damaged when these offset blocks were used than with the earlier type of guard-fence.

It was found that the breaking strength of the cable was increased by the use of thimbles in the loops of the cable and that the clips must be placed in a certain way to provide maximum holding power. The proper way to attach wire rope clips is to have the U-bolt in direct contact with the dead end of the rope, so that all the clips are facing in the same direction.

Tests of Later Types of Guard-Rail

This brings the record of testing up to December, 1928, and briefly outlines the results of the tests covered by Mr. Mattimore's paper delivered before the Highway Research Board at that time. Perhaps other highway engineers had made a study of highway guard-rail design and conducted some tests, but no record of any general series of tests is available.

In 1931 a series of tests was made under the direction of Searcy B. Slack, Bridge Engineer of the State Highway Board of Georgia, on some of the newer types of highway guard-fence, such as woven wire and flexible steel plates, in addition to the older and wire rope types. These tests indicated the interest which was being shown in the development of a guard-rail which would tend to protect the vehicle and the occupants to a greater extent than those types which had been in use.

A more elaborate series of tests was conducted by Mr. Slack in 1933 covering many types and conditions of construction, and a few other tests have been made, but in general the results of such tests are not available for distribution.

Recent Tests

The tests conducted under the supervision of the writer during the summer of 1933 covered several general types of guard-rail, as indicated later. For these tests a field was selected about four miles south of Canton, Ohio, and a runway consisting of heavy planking with guides for the wheels erected on a convenient hill. The total length of the runway was 335 feet, with an average slope of 13.18 per cent. It was sufficient to give the vehicle a speed of about 30 miles per hour, running without power and from a standing position at top of the runway.

The field selected was of firm clay soil sufficiently uniform in quality to provide full support for all the posts. Calcium chloride was mixed at the foot of the runway and served effectively for allaying dust without making the ground slippery. Dust elimination was necessary in order to aid in taking photographs.

Each guard-rail was erected at the foot of the runway at an angle of 20° with the center line of the runway. It was not possible to use the same holes for all types of guard-rails, but the holes were located in such a manner that they did not interefere with the proper setting of the posts. Each post was set at the depth called for in the specifications for that guard-rail, and the earth properly tamped. Guard-rails requiring concrete deadmen were installed by sinking the hole for the concrete block and then cutting a channel for the anchor rod without disturbing the remainder of the earth.

The speed of the vehicle was determined by an automatic timing apparatus. Each vehicle was weighed prior to the test, and, if necessary, additional weight was added to bring the gross weight of the truck to 10,000 pounds, which was used for all the truck tests. In general, sedans were used for the automobile tests and their weights varied with the manufacture of sedan used.

The longitudinal movement of each post was determined by measuring from a fixed bench mark to a point on each post before and after each test. Readings from a fixed base line set by a transit were also taken to these points on the post to determine the lateral deflection.

During the process of erection and finally before each test was made, every installation was inspected to make certain that all requirements of the specifications issued by the manufacturer or by the Highway Department using such rail had been followed by the erector.

The primary purpose of the investigation was the development of a panel type of guard-rail using heavy gage flat steel plates having rolled edges. The impact of a Marmon coach weighing 4,450 pounds and traveling at a speed of 30 miles per hour at time of impact demolished one light steel post, but the damage to the rail and vehicle was slight. The auto coasted for a distance of about

200 feet after contact with the guard-rail, where it was stopped by an auxiliary barrier.

A considerable number of tests were made with this type of rail, using all wooden posts with knee brace and construction and also using end anchorages attached to wooden posts with intermediate light steel posts. Tests were also made on plain plate guard-rail of both light and heavy gage, and the results obtained for the heavy gage steel were about the same as shown.

To Understand the Results of the Tests

In studying the results of this series of tests it was borne in mind that the damage to the vehicle was no doubt much greater than would have been the case if new automobiles and trucks had been used, but the effect of the vehicle on the guard-fence was probably about the same as for a new vehicle. It is impossible to adequately depict the results of the test by a written description, a compilation of data, or photographs. It requires a combination of sight and sound to properly bring out the terrific forces exerted by a vehicle moving at a speed of 30 miles per hour and indicate the resistance which a highway guard must exert to withstand such impact.

No attempt is made in this paper to give details or photographs showing the results of tests on the several types of guard-rails, but the purpose is to indicate the methods used and show some typical examples of the results obtained.

There are many other types of guard-fence being developed which are no doubt very satisfactory, and this paper should not be construed as covering anything more than the work which was done in the recent tests.

It seems also quite probable, from the results of these tests, that if such tests could be conducted with a driver in the vehicle or a device to turn the wheels away from the guard at the moment of impact, which would be the natural condition if the accident were caused by skidding, highway guards made of heavy steel plates would act in an unusually effective manner.*

Using the Full Strength of the Guard-Rail

From personal observation covering a period of years it is the belief of the writer that the necessity for keeping the vehicle away from contact with the posts is obvious, and it seems equally obvious that the most satisfactory results will be obtained from highway guard-rail in which end anchorages are used having sufficient rigidity to utilize the full strength of the guard-rail throughout its entire length, rather than depending on the resistance of heavy posts.

The subject of guard-rail design is attracting the attention of highway engineers, and many improvements may be expected during the next few years. Some of the modern types of guard-rail provide a reasonable degree of protection for the traveling public, and there are other types which are now wholly inadequate owing to the increase in speed of motor-vehicle traffic.

—From a paper presented at the Twentieth Annual Road School at Purdue University, Lafayette, Ind.

* EDITORIAL NOTE.—Inasmuch as the operators of many motor-vehicles involved in accidents of this type have momentarily lost control of the vehicles, only slight reliance should be placed on the human element in reducing damage caused by impact. [T.R.K.]

Pre-cast Paving for Street-Railway Tracks

Seattle Solves Dangerous Traffic Hazards with CWA Labor

By M. O. SYLLIAASEN

City Engineer,
Seattle, Wash.

DURING a long period the city of Seattle was in an unfortunate position in regard to its municipally owned street-railway system, which had a considerable mileage of unpaved, open tracks that had proved to be a dangerous traffic hazard. For years it was impossible to do any paving work on these tracks because of the depleted financial condition of the street-railway system. With the advent of the Civil Works Administration, in search of needed public improvements, Seattle was able to secure approval for the paving of a large portion of the unpaved tracks with a pre-cast reinforced concrete slab developed locally.

Under the CWA program, 68,050 slabs of reinforced concrete were manufactured between January 25 and March 16, 1934, a sufficient number to pave 8.2 miles of double track. Up to the first of April, 6.2 miles of this slab pavement had been laid, and the remainder is being laid under the new Federal Emergency Relief Administration program.

This type of pavement has the advantage of not requiring the placing of new ties and rails, and may be removed at any time with a small portable crane for track adjustment. The city had previously experimented with this type of pavement over several distances and found it entirely satisfactory.

Three plants were set up in various parts of the city to manufacture these slabs, which are in the following sizes:

Outside slabs measure 16⅛″ x 7½″ x 4″ and are reinforced with 20 lbs. of steel in form of ⅜″ round and ¼″ square bars.

Track slabs measure 25¾″ x 53½″ x 4″ and are reinforced with 15 lbs. of steel in form of ⅜″ round and ¼″ square bars.

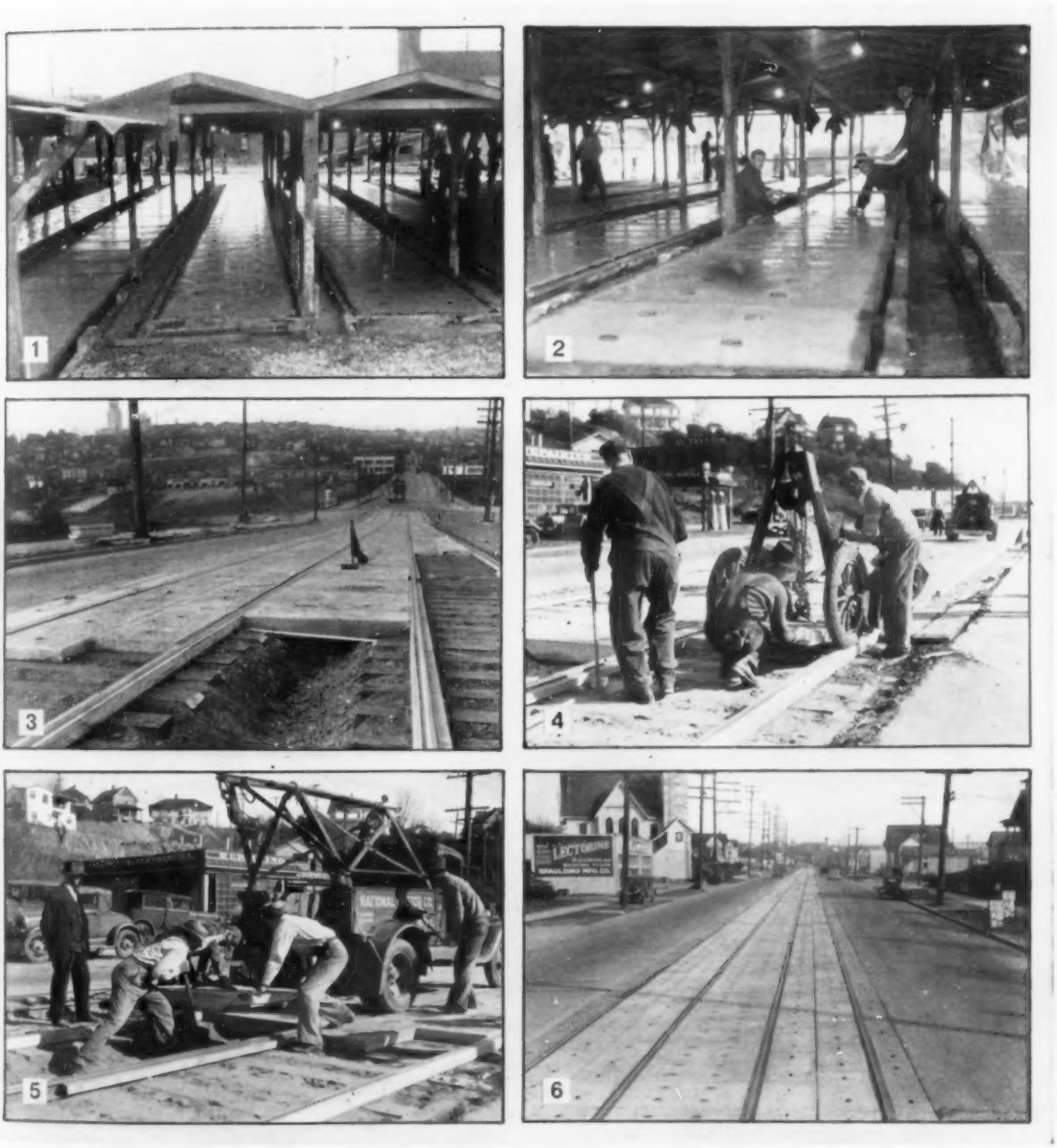
Center slabs measure 35½″ x 56½″ x 4″ and are reinforced with 39 lbs. of steel in form of ½″ square bars.

Early strength cement was used, permitting the removal

of the slab from the wooden forms within 48 hours.

The roadbed was prepared by removing all excess earth over the ties between the tracks so that the slabs would have an even bearing on the ties. The center slab between the two sets of tracks is thickened for the center half over a ditch prepared for drainage, as shown in one of the illustrations. The track slabs are placed with a small portable crane, and the heavier center slabs are placed with a light weight automobile towing crane. For both the track slabs and the center slabs, a wooden liner is placed against the rails. The track slabs weigh 479 pounds each, the outside slabs 395 pounds each, and the center slabs between the two sets of tracks, 990 pounds each. The finished project, as shown in the last illustration, gives a smooth-riding roadway devoid of rattling due to street-car operation, and firm and sufficiently strong to handle the heaviest truck traffic. It will be noted that each slab has two holes cast in it to permit easy handling. Holes are also provided at 100-foot intervals for bolting the slabs to the ties with lag screws to prevent creeping.

This worth-while project has provided three months' employment for about 2,500 men under the supervision of the City Engineer, with the cooperation of the Seattle Municipal Railway.



THE MANUFACTURE AND THE USE OF REINFORCED CONCRETE STREET-RAILWAY TRACK PAVING SLABS IN SEATTLE, WASH.

1. A section of one of the manufacturing plants. 2. Finishing operations on the slabs. 3. The different types of slabs in place, and the manner of preparing the roadbed to receive them. 4. The method of placing the track slab with a small portable crane. 5. Placing a 990-pound center slab. Note the wooden liners along the rails. 6. The completed project, showing the holes for handling the individual slabs

Terminal Wholesale Produce Markets

By **CAROLINE B. SHERMAN**

Associate Agricultural Economist,
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TERMINAL wholesale produce markets, as a class, are peculiarly adapted to present conditions. They are essentially the product of complex living. Every large city now demands huge volumes of fruits and vegetables. Long-distance shipment, specialized commercial agriculture, large cities with complex distribution methods drawing huge supplies from innumerable points, and with all kinds of demand from lowly to exacting, brought the need for them, since theirs is primarily a concentrating and distributing function. The nature of the trade in fruits and vegetables makes it necessary that they be brought together in one place. Thus the conditions of competition may be equalized to a certain extent.

These markets facilitate the efficient reception of great quantities. The jobbers can get all their supplies at one place instead of sending to several. Refrigerator and other cars can be released promptly. Produce is distributed with relative promptitude to wholesale and large retail dealers or storage houses throughout the city. Thus these markets encourage direct carlot shipments from growers and shippers and reduce the multiplicity of crosshauls, rehandlings, wastes, and delays that were increasing under former conditions.

Further extensions of chain-store operations and other new tendencies may eventually decrease the present essential nature of their function, but the relatively successful development of many such markets during fairly recent years, when many markets of other kinds were in difficulties, has been notable. Students of the situation estimated that during 1931 approximately $12,000,000 was spent on terminal market developments.

Sales-Shed and Individual-Unit Types

These markets vary in character. Most of them are privately owned, such ownership usually being held by railroads; the Bronx Terminal Market, which cannot be classed among the successful, is municipally owned. The facilities are usually one of two kinds: the sales-shed type, as at Philadelphia and Pittsburgh; and the individual-unit type, as the Northern Ohio Food Terminal in Cleveland and the Niagara Food Terminal in Buffalo.

The sales-shed type is usually controlled by a railroad or several railroads; the individual-unit type is usually developed by railroad interests but the control of operation by trade is usually greater in this type of market. The unit type offers trackage and warehouse facilities of all kinds, unit stores for wholesalers and jobbers, an auction, and in some instances a growers' market for local produce brought in by motor truck. The sales-shed type usually differs only in that it does not have individual quarters for wholesalers and jobbers, but does have a general warehouse floor where goods are displayed and sold. The individual companies occupy office space elsewhere.

The opinions of marketing interests vary as to the respective merits of these methods. The unit type is likely to be preferred in those cities in which the majority of the carlot receivers break up the carloads they receive into smaller units for their trade. In the large primary markets about an equal number of each type are operating.

Boston, Pittsburgh, Chicago

The facilities and business of terminal produce markets can perhaps best be indicated by a few examples. The Boston Market Terminal, operated by a company bearing that name, is situated on property rented from the New York, New Haven & Hartford Railroad Co. There has been no regular expense to the city beyond the paving of a few streets in the vicinity. A year or two ago the produce received daily averaged around 100 cars with about 150 cars for Monday morning's sale. During 1933 the

AIRPLANE VIEW OF DETROIT UNION PRODUCE TERMINAL

The site covers 38 acres; display space over 100,000 square feet. This picture does not show a wholesale produce warehouse for the grocery company now located in the vacant space shown in the lower left center of the picture—across the street from the gas tank

quantity received was somewhat less, but totaled around 20,000 cars with an approximate value of $1,000 a carload. There are no storage facilities in this terminal. Cars are unloaded in the terminal and the produce is sold and hauled away. Such stock as remains unsold after 48 hours is subject to a penalty. Surrounding yards have a holding capacity of about 300 cars.

NORTHERN OHIO FOOD TERMINAL, CLEVELAND

In Pittsburgh the Pennsylvania Railroad Produce Terminal, owned by the railroad, has an unloading platform, approximately five blocks in length, that accommodates about 325 carloads. Adjacent storage yards accommodate 600 cars. A storage yard nearby takes care of 450 cars. Total investment in platform and office building is estimated at $1,000,000; the estimates of the value of the ground used for storage yards range from $5,000,000 to $6,000,000. The latest addition, in the storage yards, is a banana-ripening house, built by the railroad, with a capacity of eight carloads. With a ripening time of two to three days, this makes a turnover of sixteen to twenty-four cars a week. This house has been leased to private interests. Other private interests had already erected a cold storage plant adjacent to the platform which has a capacity greater than any five cold storage plants in the city—3,000,000 cubic feet, accommodating between 700 and 800 cars of perishable products. The average quantity of produce handled at the terminal approximates 40,000 yearly, or about 90 per cent of all produce ariving in Pittsburgh.

South Water Market, in Chicago, covers 374,000 square feet of ground exclusive of streets, with an approximate investment of $12,000,000. It handles around 75,000 carloads of produce annually. This is approximately 65 per cent of all produce that arrives in Chicago by rail. The market is made up of 156 units, each with three stories and basement and each equipped with refrigeration from a central plant. It does not have railroad switching facilities. Its financial arrangements are undergoing a readjustment at present.

Cleveland, Philadelphia, Detroit

In Cleveland, in order to develop the Northern Ohio Food Terminal, Inc., which has an approximate total investment of $6,000,000, a tract of 43 acres of land was cleared in the dense slum area of the city; more than 300 buildings were razed and several streets and alleys were vacated. More than 90 per cent of all rail produce receipts of the city are handled in this market. Within its boundaries are extensive trackage facilities, large cold storages, a farmers' market with more than 300 shed stands, several leading wholesale cash-and-carry grocery firms, wholesale poultry and meat dealers, and dealers in dairy products.

In Philadelphia it is estimated that the two perishable produce terminals, the Pennsylvania Produce Terminal, and the Baltimore & Ohio and Reading Produce Terminal, handle about 95 per cent of all produce arriving by rail.

In Detroit, the Union Produce Terminal, so situated that any carload of perishables entering the city on any railroad can be switched to it, was for a time the only terminal market in the city. In 1930 it handled around 33,000 carloads of produce. The total received in Detroit during the past year has been somewhat less and has been divided somewhere near equally between the Union Produce Terminal and the newer Central Produce Terminal, according to the latest expert estimates.

Need for Centralization

All indications point to the general desirability of one concentration area for the wholesale and jobbing business of a city. The Interstate Commerce Commission in 1932 published a report on duplication of terminals in a city, describing particularly the situations in Buffalo and Baltimore, and outlining the consequent wastes, also calling upon the trade and public opinion to support the railways in eliminating duplication and wastes. The National Association of Marketing Officials has also had something to say regarding such duplications and controversies between two terminals in one city, through their Committee on City Markets. They point out that one of the serious handicaps of terminal markets is the fact that powerful financial interests, in their effort to dominate terminals, have sometimes used the operators on these markets as instruments to carry on conflicts that bring serious inefficiencies.

Terminal wholesale markets are now a major influence in the city distribution of fruits and vegetables, the consumption of which has so vastly increased during the last decade. If these markets are developed with forethought and cooperation into one centralizing service agency per city, they have great potential usefulness in the huge and essential enterprise of feeding our cities.

The Bureau of Water, Cicero, Illinois, Carries Its Case to the Consumer

Annual Report Distributed Throughout the Town to Awaken Interest in Reorganization of the Department

IN order to stimulate a greater interest in the operation of the Bureau of Water, copies of the 1933 Annual Report of the Cicero Bureau of Water were distributed to water users throughout the town. Accompanying each report was a letter, from which the three following paragraphs are quoted:

"Water is a commodity that everyone purchases. The problems of the Bureau of Water, then, are the problems of every water user.

"Because of the indifferent attitude on the part of the Cicero people, the Bureau of Water was permitted to become a disorganized and money-losing Department. I ask you to take a part in the reorganization of the Department by interesting yourself in its problems and difficulties.

"You can help make the Cicero Bureau of Water an economical and efficient Department. Set aside ten minutes of your time to carefully read and study this report. Then send me your comments, criticism, and any suggestions you may have."

The 1934 Annual Report

The remainder of this article is composed of unquoted abstracts from the Annual Report of the Bureau of Water of the town of Cicero, dated January 1, 1934. The Superintendent, Frank J. Broz, makes a perfectly frank statement of conditions existing in Cicero and of the steps which have already been taken to overcome them. This is a type of report which can accomplish much for any municipal department, since it makes the taxpayer, and in this case the consumer, definitely a stockholder who is receiving an understandable report of the condition of his utility.

The Bureau of Water of the town of Cicero is operated independently of the town departments. This is due to the fact that the Department is theoretically self-supporting; that its total expenses should be paid from the receipts of its water billing. For this reason no direct appropriation is made by the town of Cicero to cover its cost of operation. Salaries of the Bureau of Water employees, the general expenses of operation, plus the cost of the water purchased from the city of Chicago, should therefore be paid from the receipts of the water bills.

Water is supplied by the city of Chicago through three mains located at 26th Street and the city limits, 52nd Avenue and Roosevelt Road, and 59th Avenue and Roosevelt Road. The charge made by the city of Chicago to the town of Cicero for this water is 60 cents per 1,000 cubic feet. The Bureau of Water charges its consumers $1.00 per 1,000 cubic feet. The difference of 40 cents per 1,000 cubic feet is supposed to cover all operating expenses of the Department. For several years the income of the Bureau of Water has not been sufficient to cover its total expenses. The Department has been suffering annual losses. The report of Parker, Howard and Company, certified public accountants, on September 30, 1932, showed the following deficits:

1927	$8,790.09
1928	7,348.81
1929	5,698.56
1930	23,399.03
1931	34,721.27

During this same period the report shows that the Bureau of Water was increasing its purchases of water from the city of Chicago. The purchase cost of the water supplied by the city of Chicago for those years was as follows:

1927	$142,984.24
1928	160,165.40
1929	174,638.44
1930	182,333.94
1931	177,731.02

The increased purchase of water should normally have resulted in a proportionate increase in the amount billed to the consumer, and therefore in an increased income for the Department. But instead the Department was sustaining increased losses annually. The reason for this abnormal condition was the great amount of water that was unaccounted for during those years. "Unaccounted-for" water is water for which nobody has been billed. A part of this unaccounted-for water, of course, is that used by the Fire Department in extinguishing fires within the confines of the town. Another part is water which is supplied to churches and municipal buildings free of charge under the provisions of an ordinance passed in 1920, which provides as follows:

"Section 20 (Exemptions—Charitable, Municipal, Religious Institutions and Armories):

"The Bureau of Water shall remit and cancel all water rates and charges . . . which may hereafter be levied and assessed against such property of any charitable or religious institution in the town, as is used in the immediate conduct of carrying-on of the charitable or religious purposes of such institution, or which have been heretofore or may hereafter be levied and assessed against any armory of the National Guard."

But the greatest part of the unaccounted-for water was due to the following losses: (1) water which was used but unpaid for, that is, water which was properly used by the consumer but for which no billing covering the *entire* usage was made out; (2) losses of water through leaks in the street mains; (3) losses of water through leaks on private property.

The "unaccounted" water for the years from 1927 through 1931 was as follows:

1927	69,288,000	cubic feet unaccounted for
1928	78,554,000	cubic feet unaccounted for
1929	88,634,000	cubic feet unaccounted for
1930	128,954,000	cubic feet unaccounted for
1931	130,904,000	cubic feet unaccounted for

In 1931 approximately 40 per cent of the total water purchased from the city of Chicago was unaccounted for on the books of the Bureau of Water. At a cost of 60 cents per 1,000 cubic feet, which is the rate charged by the city of Chicago, this "lost" water for the year 1931 cost $78,542.40. The purchase cost of the unaccounted-for water for the years 1927, 1928, 1929, 1930, 1931 totals $297,800.40.

The tremendous amount of water lost through street main leaks and property leaks, while vitally affecting the financial condition of the Bureau of Water, also affected to a degree the water pressure of the town. There has been a growing criticism during the past several years of low water pressure. During the summer months particularly, complaints have been received by the Department that second- and third-story flats were unable to obtain water during certain periods of the day.

But even more serious than the inconvenience caused to the water consumer living in second-story flats or apartments is the fire hazard caused by the low water pressure.

The main reason for the low water pressure, which creates a fire hazard for the entire community, is the entire lack of large mains. The leakage through street mains and house leaks contributes to the decrease of the water pressure, but the *main* factor is the small mains.

Fire Protection Facilities Insufficient

Engineers of the Pitometer Company, of New York, who made a survey of the Cicero water system, say in their final report of September, 1933:

"The fire protection facilities of the system are inadequate."

And further:

"The main system does not afford a sufficient domestic supply and is entirely inadequate for fire protection."

Practically the same statement is made by engineers of the National Board of Fire Underwriters in their report dated November 14, 1931. The report reads as follows:

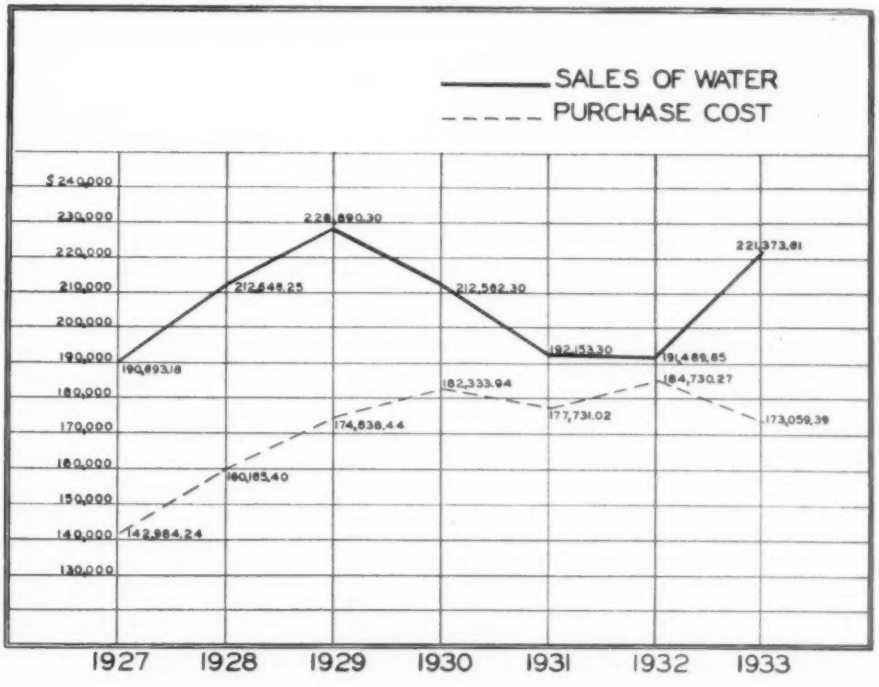
"The arterial system is incomplete and entirely inadequate for the needs of the town."

In a general summary of their report they state:

"In the principal mercantile district, easily combustible construction in large areas combines with an inadequate and unreliable water supply to make serious fires probable. In residential sections the fire hazard is material because of the close grouping of buildings and the *seriously inadequate water supply.*"

As a result of the investigation by the engineers of the National Board of Fire Underwriters, the town of Cicero was given a lower rating by the Chicago Board of Fire Underwriters, being reduced from Class 4 to Class 6. The difference in rating does not affect dwellings and buildings used strictly for habitation. But the changed rating affects the owners of commercial buildings, stores, factories and business houses. Their insurance rates have increased approximately 10 to 11 per cent.

THE RESULTS OF THE EFFORTS OF THE BUREAU OF WATER TO REDUCE OPERATING COSTS



Other Evidence of an Inadequate Distribution System

That the present water system is inadeqate is evident when a comparison is made of the Cicero system and the Berwyn water system. The communities are topographically alike. The sizes of the mains in the distribution system of the two communities are as follows:

Cicero	Sizes of Mains	Berwyn
8 2/3 miles	4″ mains	7 1/5 miles
60 1/4 "	6″ "	59 1/5 "
16 2/3 "	8″ "	6 3/4 "
1 1/4 "	10″ "	1/2 "
1/3 "	12″ "	7 1/3 "
1/4 "	16″ "	3 "
0 "	24″ "	2 2/3 "
87 1/3 miles	*Total*	86 1/3 miles.

Berwyn has 13 miles of mains that are 12-inch or over

in size. Cicero has ½-mile of large size mains. Both communities have approximately 87 miles of water mains. Cicero has a population of 70,000. Berwyn, which is one-third smaller in area, has a 45,000 population and 87 miles of water mains.

Water is supplied the town of Cicero through a short length of 16-inch pipe at 26th Street and the city limits. There are short 12-inch supply mains at the 59th Avenue and the 52d Avenue junctions. The city of Chicago is now building a 24-inch main on 52d Avenue, connecting the 24-inch main on Roosevelt Road to the 36-inch main on Lexington Street.

With most of the Cicero distribution system composed of 8- and 6-inch pipe it can be readily seen that although the water supply is ample the system is inadequate.

Reducing Unaccounted-for Water

The Superintendent of the Bureau of Water, upon assuming office on April 19, 1932, was faced with the problem of properly balancing the Department's finances. In order to do this, he had to reduce the unaccounted-for water, which was causing an increasing deficit annually. The problem divided itself into three parts: (1) stopping underground leaks; (2) stopping house or property leaks; and (3) billing consumers by actual meter readings.

Stopping Underground Leaks.—This part of the program called for the work of expert and specially trained engineers. The Superintendent of Water, after consultation with the President and the Board of Trustees, contracted with the Pitometer Company, of New York, to do the work. In May, 1933, the company engineers began a waste survey of the Cicero water system. Their work consisted mainly in dividing the system into eight districts and checking the water consumption in each district for a period of 24 hours. If they discovered a high usage of water during the early hours of the morning, when there should have been a low usage, they began to look for leaks, with the aid of sensitive instruments.

Upon the completion of their survey, the Pitometer Company engineers reported the discovery and repair of street leaks which had caused a loss of 1,963,000 gallons a day. This was 22 per cent of the total consumption as measured by districts, and almost 30 per cent of the average daily consumption for a year. The leakage was distributed as follows:

Service leaks	120	1,664,000 gals. per day
Leaks on mains	9	294,000 " " "
Leaks on fire hydrants	4	5,000 " " "
Total	133	1,963,000 gals. per day

The causes of these leaks were several. Most of the leaks in lead or iron services were caused by the breaking or snapping of the lead pipe as a result of vibration caused by traffic or the settling of the ground. Investigation developed that lead services were laid in the same ditches as sewer drains instead of being laid on "shelves" of solid ground. The lead was stretched too tight and the snapping of the lead services resulted. The breaking of connections joining the mains, known as "joint" leaks, contributed the other major share of the leakage.

At a rate of 8.6 cents per 1,000 gallons (which includes purchase cost of water plus cost of Department operation) the repair of 1,963,000 gallons leakage represents a saving of $168.32 per day, or $61,620.00 per year. The cost of the engineering for the survey was $7,000.00. At $168.00 per day, the entire cost of the survey would have been covered 42 days after completion of the field work. The benefits of this survey will accrue to the town of Cicero for the next five years.

Stopping House Leaks.—In dealing with this problem it was necessary to install a new system of meter reading. Previous to April 19, 1932, it was the general practice to give meter readers books which contained all previous readings. With the previous readings before them, they merely estimated the meter readings instead of actually reading the meters. When a check was made, meters were found that had been out of order for several years, yet estimated readings were made every half-year, and bills based on this estimate were sent out. Other meters were found which had cumulative excesses of several years, because the consumer had been billed at the minimum rate.

By ordinance all one-flat buildings are required to pay a minimum bill of $3.00 for usage up to 3,000 cubic feet. The minimum bill of a two-flat building is $5.00; a three-flat building, $7.00; a four-flat building, $9.00. Because of the practice of estimating meter readings, most of the bills were minimum bills.

To correct this, after April, 1932, meter readers were given sheets that contained only the addresses of the buildings whose meters they were to read. Having no knowledge of the previous reading, they had to make an actual reading of the meters. This caused much criticism. One of the unfortunate results of the "estimate" system of reading was the feeling on the part of the general consumer that he was required to pay only the minimum bill of $3.00 semi-yearly, or $5.00, or $7.00 or $9.00 according to the size of his building. This practice, which had become established over a period of years, created the impression that no one need pay anything over the minimum rate. The change to a system of actual meter reading caused increases in the billing, although water rates remained the same.

Billing under this new system brought abnormal results for a time. Bills for one-flat buildings ran from $5.00 to $100.00. Bills for two-flat buildings ran from $10.00 to $150.00. The huge bills were the result of reading the cumulative excesses of water that had been used over a period of years, but because of the minimum billing had never been paid for.

It would have been unjust to make the user the innocent victim of this practice, so most of these excessive bills were adjusted and the amounts written off the books. The total accumulated excesses on meters in the town of Cicero which were not billed but were written off the books in 1933 amounted to $164,900.00.

Another result of the actual meter reading system was the discovery that a very high per cent of the buildings contained house leaks. When the water consumer received a $3.00 bill semi-annually whether he wasted water or not, there was no incentive for him to repair and stop faucet leaks or toilet leaks. The rubber mechanism of the faucet, which has a normal life of two or three years, was permitted to become faulty and no repairs were made. As long as the water consumer received bills for $3.00, he saw no reason to repair leaks. Yearly the water losses caused by this habit became more costly.

But when bills based on actual readings were sent out,—bills that were high because of house leakage,—there was much complaint. Whenever a complaint was made, an inspector was sent to the premises to check for house leaks. When leaks were found, no adjustments were made on the

bill unless the condition was repaired. This had a tendency to reduce water wastage and cut down the amount of unaccounted-for water.

A Meter Repair Shop Established

A check-up by the meter readers revealed that, of 13,000 meters in Cicero, nearly 4,000 were out of order. Most of these users were paying minimum bills when a majority of them were using a great deal more water. To facilitate the replacing and repair of "dead" meters, a workshop was established. By December, 1933, over 2,000 stopped meters had been replaced with other meters in perfect working order. Here again, people who had been accustomed to minimum bills but who were actually using more water, or permitting it to waste through leaks, were unable to understand the increased billing.

During the year 1933 a careful check was kept of all meters actually operating in the four districts into which the town is divided for the purpose of billing.

Two readings were taken of the meters in each section. The study of these readings for a one-family home (minimum rate of $3.00) revealed:

ONE-FAMILY HOUSE ($3.00 MINIMUM RATE)

District	When Read	No. of Meters Operating	No. of Meters Showing Excess	Average Bill	Average Excess
1.....	March	596	537	$5.81	$2.81
1.....	Sept.	655	583	5.84	2.84
2.....	April	1,869	1,360	4.61	1.61
2.....	Oct.	1,757	1,390	5.05	2.05
3.....	May	1,927	1,252	4.71	1.71
3.....	Nov.	1,993	1,337	4.62	1.62
4.....	June	1,028	588	5.29	2.29
4.....	Dec.	1,048	778	6.25	3.25
				Average excess.....	2.55

This survey showed clearly that most of the one-family homes were using more than the minimum of water. The average bill would be exactly $5.55. Yet a majority of them for years had been receiving bills for only $3.00.

The same survey was made of two-flat buildings:

TWO-FLAT BUILDINGS ($5.00 MINIMUM)

District	When Read	No. of Meters Operating	No. of Meters Showing Excess	Average Bill	Average Excess
1.....	March	1,035	936	$9.38	$4.38
1.....	Sept.	1,191	669	8.65	3.65
2.....	April	682	525	8.36	3.36
2.....	Oct.	616	500	7.60	2.60
3.....	May	1,081	691	7.54	2.54
3.....	Nov.	1,067	631	7.05	2.05
4.....	June	435	222	8.15	3.15
4.....	Dec.	427	261	7.63	2.63
				Average excess.....	3.05

The average bill for a two-flat building is $8.05.

By similar data the average excess of a three-flat building was discovered to be $4.44, which when added to the $7.00 minimum charge would make the average bill $11.44. Four-flat buildings averaged a $7.79 excess, or a total bill of $16.79.

These figures, based on a survey made over the entire year of 1933, show that the Cicero water user was using more than the minimum rate of water. But the habit of paying only the minimum rate was so strongly established that it was difficult for the average consumer to understand.

The actual reading of meters resulted, too, in an increase in monthly accounts. All large users of water who used $2.00 worth of water or more monthly have their meters read every month and receive water bills monthly. On April, 1932, there were 257 users on monthly accounts. As large users were discovered, they were transferred from the six-month accounts to monthly accounts. Most of those transferred were business houses, factories, and businesses requiring large amounts of water. By December, 1933, there were 555 monthly accounts.

Meters for Churches and Institutions

Another part of the program to eliminate waste and to decrease the unaccounted-for water was the installation of meters in churches and other institutions which were receiving water free of charge under section 20 of the ordinance of 1920. The section provided:

"All such institutions . . . shall be provided with a water meter and unnecessary waste of water shall be eliminated."

By putting in meters for the purpose of checking only, numerous leaks were found in the buildings receiving their water free, and repairs were made.

CWA Projects

In the latter months of 1933, when the Federal Government through the Civil Works Administration offered to supply the labor and pay a small part of the material cost of civic projects that would put men to work and also do constructive work, the Superintendent of Water made application for six projects. All were approved and approximately 215 men were put to work in December, 1933, and January, 1934.

One of the projects, 1088-B, called for civil engineers, chainmen and draftsmen to make a complete record of the Cicero water system. The lack of records and plats of the Cicero system was severely criticized in the survey made by the engineers of the National Board of Fire Underwriters in 1931.

In keeping with these criticisms and recommendations, the CWA draftsmen prepared permanent records on heavy linen of all valves, hydrants and other physical property of the Cicero Bureau of Water. Another project, 1088-C, required the services of four men to repair and paint all fire hydrants.

Two other projects, 1088 and 1088-A, under which very important work was accomplished, employed 42 men. Approximately 210 cement manholes were built around valves that were buried in the earth. Whenever they became jammed or broken it was necessary to dig 6 to 10 feet into the ground before repairs could be made. The Pitometer Company report suggested that "valves be placed in manholes to facilitate inspection and repair." Nearly 130 manholes were built by an unusually efficient crew of CWA employees.

The most important work done under the Civil Works Administration in the Bureau of Water was the inspecting and checking of every building in the town for meter and property leaks. Considering the condition of the town, this was a vast undertaking.

Two projects, 239 and 239-A, entailing the employment of approximately 150 men, were approved to do this work. These men were divided into crews under the supervision, mostly, of regular employees of the Bureau of Water and methodically inspected all sections of the town.

The importance of the work done under projects 239 and 239-A cannot be too highly stressed. These 150 men corrected a condition that had already cost the taxpayers thousands of dollars, and which if permitted to continue would cost many thousands more. They located leaks that have caused thousands upon thousands of gallons of water a day to be wasted.

Upon discovery of leaks in premises, these men reported their discovery to the property owner and requested him to make immediate repairs. If the leaks were at the meter or in pipes under the control of the Bureau of Water instead of the property owner, they made immediate repairs.

Results and Benefits

From 1929 to 1931 there was a steady and rapid decline in the amount of water billed the public. During the same years there was an increase in the amount of water purchased. In 1932 the water sales were slightly lower than in 1931. Sales of water in 1931 amounted to $192,153.30, while in 1932 they amounted to $191,489.85. The reason for this is that the full force of my program did not take effect until 1933.

In 1933 the water purchases decreased nearly $12,000 over the previous year, and reached slightly under the 1929 level. Water billings, on the other hand, increased $30,000 to amount to $221,373.61.

Account, however, should be taken of the fact that adjustments had to be made on bills that showed an abnormal consumption which was caused by property leakage. The economic situation warranted the tempering of justice with mercy. Furthermore, there were many cases where consumers were unable to pay for the water used. Realizing that most of the people had suffered financial reverses during the past year, no determined effort was made to force payment by those who could not afford to do this at the present time. Treatment was otherwise for those who could afford to pay their bills.

Through the stoppage of leaks more water is available for consumption. The stoppage of underground leaks and a partial stopping of property leaks resulted in slightly increased water pressures throughout the town.

The stoppage of water waste resulted finally in a decrease in the amount of water purchased from the city of Chicago. This was partly due to the metering of some of the unaccounted-for water. Approximately 50,000,000 cubic feet of water which previously had not been accounted for was registered through meters in 1933.

The carrying-out of this program resulted in increasing expenditures for meters and parts, hydrants and parts, valves, and materials necessary to make repairs of water mains and service pipes. The cost of the water survey by the Pitometer Company also aided in bringing about an increase of departmental expenses.

It was necessary to purchase a quantity of new meters and meter parts so that 2,000 of the 4,000 stopped meters could be put into operation. The purchase of manhole covers, and manhole cover frames for street vaults also contributed to increasing expenditures, as did the purchase of hydrants and hydrant parts that were necessary to put fire hydrants into operation. Because of the amount of material necessary to repair service-pipe leaks and street-main leaks that were uncovered by the Pitometer Company survey, the expenditures for these items showed increases over expenditures for the same material in previous years.

The maintenance of meters, repairs to mains and service pipes should have been carried on as part of the duties of the Bureau of Water for the past several years. This was not done. The extraordinary expenses of the Bureau of Water for these items in 1933 was in fact paying for maintenance and repairs for the years of 1927, 1928, 1929, 1930 and 1931. If the 1933 expenditures for maintenance and repairs were spread over the past seven years and a share of the expense allocated to each year, the expenses of 1933 would be below normal.

State "Improvement Authorities" Suggested to Construct Local Public Works

CREATION of state 'improvement authorities" is suggested by Jacob L. Crane, Jr., planning consultant, of Chicago, as one means of facilitating the flow of Federal funds for the construction and operation of public works projects which local authorities cannot now, for one reason or another, handle.

Mr. Crane points to the inability of many municipalities to secure PWA funds either because the bonding limit has been reached, public credit has been impaired, or perhaps because there is a too great an accumulation of delinquent taxes. In many of such cities there may be public works projects for which the people are able to pay through service rentals, fees, and so on, even though the city's credit may be so impaired as to preclude the possibility of securing Federal aid.

It is Mr. Crane's suggestion that state (or metropolitan) improvement authorities might finance needed projects, contracting with the lending agency for funds and with the users of the project for repayment over a period of years. Not only would the financial difficulties of local authorities thus be eased, but it is probable that creation of a multiplicity of new taxing and construction agencies which are now being formed to take advantage of Federal aid offers would be avoided.

Another advantage of a central disbursing agency would be, Mr. Crane believes, removal of the difficulty attending the prosecution of a project when more than one governmental agency is involved. He asserts that some such plan has been discussed in Utah, Pennsylvania, Texas, and Michigan, though in the main these proposals have represented a tendency toward creation of many new agencies rather than an inclusive single one.

John Ickes, Engineer of the Chicago Board of Local Improvements, has worked out a program of needed projects to which this method of financing might be applied. It is suggested that Chicago could liquidate through *operating revenues* the costs of constructing super-highways, consolidated transit facilities, airports, port works, filtration plants and a metropolitan water system. Through *rentals*, Mr. Ickes points out, it would be possible to liqquidate the cost of constructing consolidated government office buildings, completion of sewage disposal plants, and several bridges and viaducts; and the *sale or lease of excess lands* purchased in connection with improvements would help to repay the cost of clearance and re-development of areas now dilapidated. Mr. Crane suggests that new schools, district or inter-municipal water-supply projects, flood-control works, river and other waterfront improvements, etc., could similarly be financed for the rest of the state.

Summer Radio Series—a New Deal in Local Government

DURING the summer months the "You and Your Government" programs, over a nation-wide network of the National Broadcasting Company, will be cut to 15 minutes, the period being from 7:30 to 7:45, Eastern Daylight Saving Time, every Tuesday evening. The general title of the summer series will be "A New Deal in Local Government." The complete program is obtainable on application to the National Municipal League, 309 East 34th Street, New York.

Municipal Power-Plant Improvements for Greenville, Texas

By A. C. KIRKWOOD
Burns & McDonnell Engineering Co.

THE city of Greenville, Texas, has recently placed in operation in its municipal power plant two diesel engines that are daily spelling the answer to some vexing problems that have faced the city administration for the last few years. The story of the installation of these engines and the problems they solve is certain to be of interest to all officials responsible for the operation of power plants, inasmuch as Greenville's problems are similar to those being faced in many other public and private utilities and industrial plants. This reference is particularly true in the case of the smaller and medium-sized plants.

History of the Municipal Power Utility

The Greenville municipal power plant was founded forty-five years ago and was designed to be one of the more economical small plants of that time. Power equipment then was far different from equivalent equipment now, and yesterday's economies are far surpassed today. The original plant contained low-pressure boilers and reciprocating steam engines. Heat-saving auxiliary equipment was virtually absent, and steam-driven auxiliary equipment used undue quantities of steam. The coal was unloaded by hand from cars to storage piles and moved from storage piles to stock piles on the firing floor by the same method. The result, when measured by today's standards, was decidedly uneconomical.

As the load grew, the plant capacity was increased by the addition of new and larger boilers and engines. Eventually steam turbines were installed and in 1932 the plant contained two turbo-generators, one rated 1,250-kw, and the other 500-kw, and two cross-compound steam engines having a total capacity of 550 kw. These engines were virtually useless on account of old age and the wear of constant use. The boiler plant contained four boilers, two of which were so old and in such condition that they were condemned as unsafe by the inspectors. Neither of the remaining boilers would carry the peak loads independently. Labor-saving devices had not replaced manual handling of coal and ashes, because of the comparatively large investment required for the size of plant involved. Some heat-saving devices had been installed previously, but their use and augmentation was hampered by the low steam pressure and temperature due to the continued use of the old equipment.

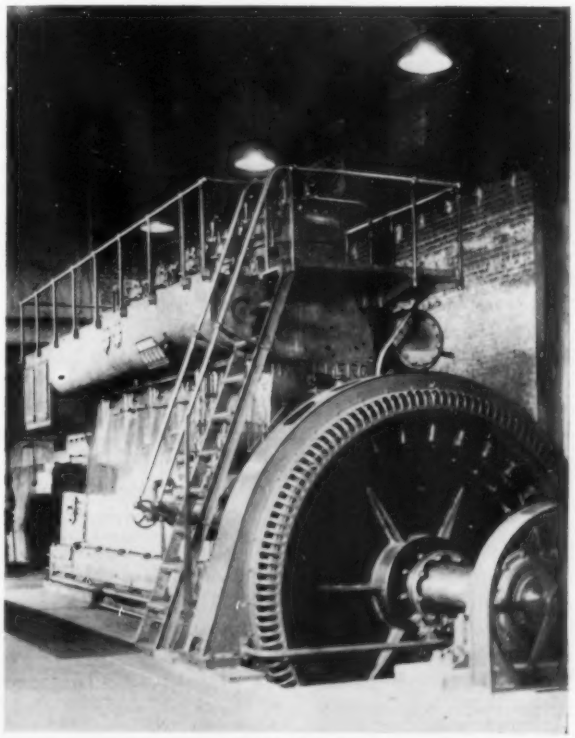
The plant peak load had grown to 1,550 kw in 1932, and to carry this load were the 1,250-kw and 500-kw turbo-generators with 550-kw standby capacity in the old cross-compound engines. Peaks of over 1,200 kw were encountered almost daily, and it was therefore self-evident that trouble with the large 1,250-kw turbo-generator meant an available plant capacity of only 1,050 kw, augmented only by the overload capacity of this equipment.

A Study of Methods of Improving the Plant

In 1930 the Commissioner of Utilities realized that major plant improvements must be made at an early date. Accordingly a thorough investigation of the plant requirements was initiated and analyses were made of various appropriate solutions to the problems of providing reliable and sufficient electric service. All factors and types of procedure were considered, and the succeeding paragraphs outline the most promising ones.

The analysis demonstrated that only the following types of improvements should be given further consideration:

1. Expansion of the present low-pressure, low-temperature steam plant.
2. Installation of high-pressure, high-temperature steam equipment, using the present equipment as standby.
3. Plans 1 and 2, using fuel oil or gas firing in place of coal.
4. Installation of one diesel unit capable of taking 750-kw to 1,250-kw load.
5. Installation of diesel equipment capable of taking entire load and using the steam plant only as standby capacity.



THE NEW 1,000-KW NORDBERG DIESEL ENGINE AT GREENVILLE

The first plan meant continuation of poor fuel economy even if coal- and ash-handling equipment were added to reduce labor costs. The available coal was of decidedly inferior quality and was therefore costly even at a low price per ton. To equip the present boilers with stokers would have been costly and would have resulted in the necessity of resetting the boilers to gain the desirable furnace volume. A detailed study of this procedure showed only modest benefit to the plant economy.

The second plan, involving at least one high-pressure boiler and one high-pressure turbine-generator with their auxiliaries, showed a decided saving in operating costs, but this was greatly reduced by the investment amortization costs.

Plan 3 obviated the necessity for the installation of coal- and ash-handling equipment, and slightly improved the operating economy, owing to better fuel. It showed the most economical results for a steam plant improvement.

Plan 4 showed a decided advantage but was hampered by the necessity of maintaining a large boiler-room operating crew and the excessive costs of intermittent operation of the steam plant. It therefore led to the investigation of plan 5, which contemplated virtually 100 per cent operation by diesel power. This plan showed such decided operating economies that it readily stood first in the comparison in spite of the relatively large investment.

Method of Promoting the Plan

By the end of 1932 it was apparent that the new equipment should be in service in December, 1933, the period of annual peak load. The City Commission, at the suggestion of Utility Commissioner T. S. Mitchell, called together a group of some twenty-five substantial business men and explained in detail the situation and the possible courses of action. This Citizens' Advisory Committee studied the proposals, canvassed many other citizens, and recommended immediate purchase and installation of the required equipment. It is well to note here that this Citizens' Advisory Committee (composed of merchants, executives, industrial plant managers, professional men, and others) has been a constant source of sound advice from the time it was first organized, and not only has aided in the selection of the actual equipment, suggested financing procedures, educated other citizens in the needs and operation of the electric system, but will continue to aid in the successful operation of this municipal utility.

Bids were received in April, 1933, for two diesel engines, generators, exciters, and the necessary auxiliary equipment, and after due study and examination of the proposals the engine contract was awarded for one Nordberg 1,000-kw and one Nordberg 700-kw unit with Westinghouse generators and exciters. The foundations and the building changes were rapidly completed, the equipment was installed in the fall, and the engine acceptance tests were made in mid-December.

The city of Greenville now has ample reliable generating capacity to meet any expected demand and, as shown in later paragraphs, can quickly retire the investment, and can purchase any future equipment out of net earnings. It can, at the same time, reduce the tax and electric rate burdens of the citizens.

In view of the economic conditions prevalent at the time of the installation of these improvements, it was decided to limit expenditures to the items necessary to provide good operation with adequate facilities to insure continuity of service. Many desirable, but not vital, improvements were left to a later date. The cost of building changes was kept to a minimum by using the existing structures wherever possible.

The New Plant

The plant is laid out with its long axis running east and west. The railroad switchtrack lies on the north side of the buildings, with the coal storage piles between the track and the boiler room. The two newest boilers are installed in the west end of the boiler room and are opposite the two turbo-generators, which are installed side by side in the west end of the turbine room with their shafts running east and west parallel to the long axis of the turbine room. Below them are the jet condensers, circulating pumps, and miscellaneous condenser equipment.

To the east of the turbine room lay the old engine room with its floor some three feet below that in the turbine room, and to the east of the engine room are two rooms housing water-plant pumping equipment. The old switchboard was located in a small alcove on the south wall of the turbine room at its westerly end. The plant lies on the south bank of the Sabine River and is sheltered by a low hill or river bank slope rising some twenty feet above the plant floor level.

The diesel units were selected of unlike capacity in order to make it possible to take advantage of the high economies obtainable at the higher engine loads. It requires but a few minutes and no extra cost to shift engines, for, unlike turbine units, it is not necessary to warm them up for twenty minutes to an hour before they can be placed under load. Under the present operating schedule the smaller unit carries the load from before midnight to 6 or 7 A.M., the larger unit from then to early evening, and both units operate during the evening peak load. The old steam boilers and the turbines are carried as reserve units to replace the diesel units during periods of inspection and maintenance.

The two diesel units, although of different sizes as far as capacity is concerned, are virtually identical engines. They have identical cylinder sizes and most of the operating parts are interchangeable. The major difference is in the number of cylinders, one having four and the other six. This materially reduces the investment in spare parts. They are installed end-to-end in the old steam engine room, and the next unit will continue this same line, being installed in place of the present 500-kw turbine generator.

The engines are installed on massive concrete foundations sunk to firm soil well below the basement floor. These foundations are separate from all building foundations and floors, in accordance with best practice. The old engine room floor was removed, and the new floor is at the same elevation as the turbine room floor. The old building walls were extended several feet to obtain the necessary head room for the diesel units, and a new steel and asbestos composition roof was installed.

Most of the engine auxiliaries are located in the basement and consist of the Goulds jacket water pumps, De Laval fuel and lubricating oil centrifuges, pumps, and tanks, the air compressors, oil coolers, starting air bottles, etc. The exhaust mufflers are located in the boiler room, and the air intake filters are mounted on the boiler room

roof. The air intake and exhaust gas piping is carried in the boiler room and the basement of the engine room, so that the engine room is free of large pipes. Other engine piping is likewise carried in the basement.

The General Electric switchboard was relocated and enlarged and is now opposite the westerly of the two engines in a position where it is central to all units now and in the future. The switchgear is behind the board except for the rheostats, which are in the basement immediately below the switchboard. They are controlled by cable connections to hand wheels mounted on the various panels.

The cooling tower is on the hill top, some 300 feet from the engines, where it is exposed to winds from any direction. The fuel-oil storage tanks are near the cooling tower, and a branch of the hot-water line is taken to coils in the fuel-oil tanks to provide the heat to insure free-flowing fuel oil at all times. These engines burn heavy oils that are quite viscous at lower air temperatures. Another branch of the hot-water line heats the fuel oil in the day tanks located in the engine room basement.

Maintenance of Steam Plant as a Standby Unit

In order to insure prompt response from the old boilers, without maintaining banked fires at considerable cost, it was decided to equip the engine exhaust mufflers with heating coils connected to the boiler-water circulating system. Thus the heat usually wasted in the exhaust gases is used to replace the fuel normally required to maintain banked fires under the boilers. The boilers are being equipped with oil burners, and the steam plant can be quickly put in service whenever required and the cost of maintaining it as a standby unit will be very small.

The Cost—An Important Consideration

Greenville now has a municipal power plant that will adequately meet the load requirements for some years, and the savings in operating costs are paying for the improvements, creating a sinking-fund for future improvements, and helping to reduce the general city taxes. And what did this plant improvement cost?

All the improvements enumerated in the preceding paragraphs were purchased and installed at a total cost of $181,663.49, or $106.86 per kw of capacity. This total cost includes interest for five years on the cost of the engines, generators and exciters.

A comparison of operating costs is highly interesting, for it shows conclusively what can be done to reduce fuel, labor and other operating costs when plant managers determine to correctly analyze their problems and to carry out the improvements required.

The water department is operated in conjunction with the electrical department, and until the recent improvements were made all water pumping was done by steam-driven pumps. When the new engines were installed, the water plant was also improved by installing electric motor-driven pumps.

The following table shows the comparative major operating costs for the fiscal year 1933, the month of January, 1933, and the same month in 1934.

From the same table it is seen that the costs of fuel, water, lubricants, and labor have been reduced some 60 per cent, and this means an annual saving of nearly $50,000. This amount will entirely pay for the improvements (interest and principal) in four years. Attention is again called to the previous statement that the $181,663.49 cost of the project includes five years' interest on three-quarters of the cost.

Item	Fiscal Year 1933	January, 1933	January, 1934
Kwhrs generated	5,298,000	434,770	419,976
Equivalent kwhrs for steam pumping (estimated)	1,840,000	141,000	.....
Total equiv. kwhrs generated	7,138,000	575,770	419,976
Fuel for electric plant	$39,633.13	$3,396.46	$1,081.68
Fuel for water plant	13,754.22	1,100.00	.....
Fuel for both plants	$53,387.35	$4,496.46	$1,081.68
Labor	$27,030.60	$2,117.67	$640.88
Water for boilers	3,000.00	250.00	.....
Lubricants	245.25	20.00	184.44
Total	$83,663.20	$6,884.13	$1,907.00
Total per kwhr	$.01172	$.01196	$.00454

That the city of Greenville has made a good investment cannot be doubted. For the last several years the electric department has paid over $2,400 per month to the general revenue fund. With these improvements making additional savings, it is logical to assume that the savings will be passed on to the consumers and taxpayers.

Greenville now rests secure in the physical proof that her city officials and interested citizens have carefully considered her electric problems and have conscientiously acted upon the findings of their studies.

Slum Clearance and Rehabilitation in Boston

A GROUP of 16 professional men—engineers, architects, landscape architects and city planners—with fourteen branch working units in different parts of the city of Boston, carried out the City Planning Board's Civil Works Project for which Federal funds to the extent of $123,360 were allocated in December, 1933. The program of the work embraced 'the collection of data to permit intensive study of the entire city to determine public works projects for immediate unemployment relief, the opportunities for slum clearance and rehabilitation, and a general comprehensive survey."

From the unanimous conclusions of the group, four paragraphs are here quoted:

One of the most important obstacles in low-cost housing is property value now in force which is based upon speculation inconsistent with the probable ultimate use of the property. President zoning in the city provides space for industrial, business, and general residential use which is more than adequate for the predicted trend for each use. Consequently, holding land for expected benefits from a change in use seems to be a fallacy and this point should be given publicity.

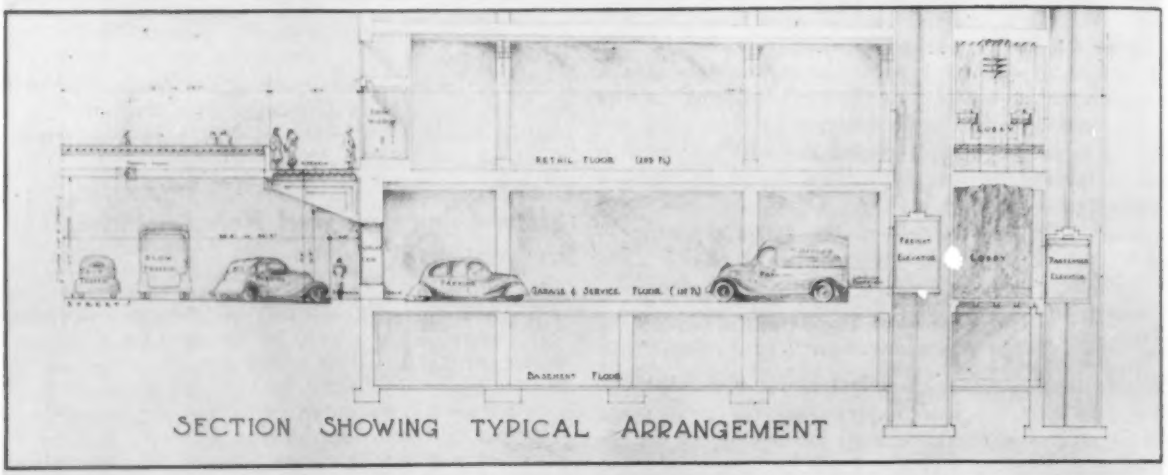
A study of the population trend of the entire city for the period 1920-1930 shows an actual decrease in the more congested districts and only a slight increase for the city as a whole. This would indicate that the peak of population increase is behind us and in the future no great increase in population is to be expected. All planning for the city as a whole should bear this in mind so that over-ambitious plans predicated on population growth will be avoided.

Because according to the zoning report of the Boston Planning Board for 1924 there would be zoned for residential use in the city of Boston sufficient area to provide for a distribution of the entire population at the rate of 9 families to the acre, and because there has been only a 4 per cent population increase since that time, the problem is not that of providing additional areas for housing, but to re-house on a basis conforming to modern social requirements.

Additional and careful study should be given to the zoning plan of the city so that necessary revisions may be made and encroachments on residential areas be more diligently guarded against.

See page 87 of this issue for a brief notice of the complete Report of the City Planning Board of Boston on this project. An 8-page photo offset summary of the Report has been issued by the Board, and may be obtained on application.

PROPOSED DEVELOPMENT WATERFRONT AREA PORTLAND ORE.



SECTION SHOWING TYPICAL ARRANGEMENT

TYPICAL INTERSECTION IN THE FIRST AUTOMOBILE CITY

A Plan for a City Built to Fit the Automobile

By THERON R. HOWSER
Secretary, City Planning Commission, Portland, Ore.

COMPLETE grade separation for the business area of a city is shown in three drawings now on display in the City Hall, Portland. Photographs of them are reproduced on the opposite page. They are a typical instance of planning in its proper sense, achieved through the work of CWA engineers and draftsmen, under the direction of the City Planning Commission of this city.

Traffic is the greatest source of inconvenience in the business area of a modern city. The loss of time, the actual damage to property, the casualties caused by the effort to have two or more objects occupy the same space at the same time—these things cannot be accurately, quantitatively measured, but it is certain that the total is enormous. It is a simple matter to design a city where none of these impediments to free and easy transaction of the necessary business of the community would be present; but to show men who have never seen any other city pattern than that of one-level streets and multi-level houses that such a city is practical—that is a real task.

The Plan-It, the mimeographed bulletin of the City Planning Commission of Portland, has been hammering away for some time on the idea here presented, with the double purpose of planning better cities and of quickening the construction industry. Build one section of one city to fit the automobile, and there will be an immediate nation-wide demand for the same thing in every city.

In its effect on rapid, independent transportation, the automobile of today plus the highway of today is all that can be wished for. It has one major defect—it can't be folded up and put into one's pocket when it gets downtown. What to do with the car while one works, shops, or plays is a problem which becomes more serious for the individual with each change in size or density of the downtown district of a city.

The Problem of Street Intersections

Some means of parking the car, no matter how dense and highly developed the downtown district becomes, will make possible the mass service of which the automobile is capable. The automobile on a "horse-and-buggy" street is only half-used. No amount of widening streets can solve the problem of street intersections. The only way to remove the clot of congestion from the circulation of a city is to make it possible for one traffic stream to go over another. Grade separation at all important traffic intersections, and entire separation of pedestrian and wheeled traffic in the business districts—this is the way to fully utilize the automobile.

Give up the ground level of the business district exclusively to wheeled traffic; make parking space of all the ground floor level; and make what is now the second floor the main floor of the city. Connect these business floors from block to block with a system of footbridges and cantilevered second-story sidewalks. Let the pedestrian shop in safety on one level, and give the autoist exclusive possession of the ground level, with a practical addition of 24 or 30 feet to the street width in all the downtown area.

In and about each 200 x 200 block it would be possible to park about 120 cars. In the congested business district in Portland there would be room for 5,000 or 6,000 cars. Today in that same area there is street parking space for not more than 1,500 cars.

If the entire ground area of the business portion of our cities were to be given up to the exclusive use of the automobile, the resulting increase in safety, convenience and comfort would be so great that it would cause the greatest period of building activity ever witnessed in America. In order to adapt all cities to the automobile and to supply the immense number of additional automobiles that would then be found desirable, everyone would be busy for a generation.

Teachers College to Hold Planning Conference

AT Teachers College, Columbia University, New York, on July 20, there will be a Conference on Educational Plant Planning with Special Reference to Its Relationship to Modern Community Planning.

During the past year especial emphasis has been placed upon the relationship of educational plant planning to all aspects of community planning. Our National Government, through its various agencies, has stressed the importance of this relationship and the values to be secured from cooperative community planning. At this Conference the points of view of city planning and school planning will be presented by those who have participated in this work in many sections of the country. The types of topics discussed will be:

The Relationship of Educational Plant Planning to Modern Community Planning.

Planning School Plants for Wider Use.

Zoning as Its Affects the Location of School Plants

The Major Street Plan as Its Affects the Location of School Plants.

The Neighborhood Unit and the School Plant

Cooperation between School Officials and Planners.

The morning sessions will begin at 10 o'clock, and afternoon sessions will be held from 2 to 4 oclock. A luncheon-meeting will be held at the Columbia University Faculty Club for those who wish to discuss problems during the lunch period. An exhibit of important developments and projects illustrating advanced planning will be on display.

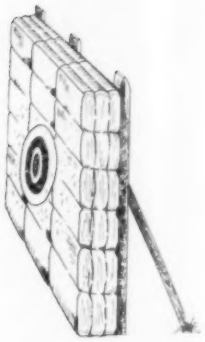
The Conference is open to all those who are interested either in a special or a general sense in developing superior programs for community and educational planning. Requests for luncheon reservations should be sent to Dr. N. L. Engelhardt, Professor of Education, Teachers College, Columbia University, New York.

Dangers from Poor Plumbing

IN a dramatic way, emphasis has again been placed upon the hazard to health presented by faulty building plumbing by the decision of the American Water Works Association to demand from convention hotels in the future definite assurance that contamination cannot enter the drinking water supply through badly arranged or poorly maintained piping. Although the organization, like the New England Water Works Association and the American Public Health Association, has for many years combated the cross-connection of potable water supplies with any other piping systems, its attention was forcibly directed to the dangers of exposing purified water to contamination within the interiors of buildings by the analysis presented during the convention of the physical background of the amebic dysentery epidemic that focused at Chicago last year.

—From *Engineering News-Record*.

Eliminating Hazards to Safety on Archery Ranges



By PHILLIP ROUNSEVELLE

INTEREST in archery has grown during the last two or three years—until the sport gives promise of becoming one of the most popular forms of recreation. One of the problems of the archer has been to find a place to shoot. All kinds of reasons are given him as to why he cannot use the playgrounds or parks of his city—except the real one.

The real reason is fear of the supposed dangers. I say "supposed," because I believe that the injuries caused by archery almost equal those of ping pong!

Everyone is afraid of an arrow. A well-known soldier of fortune told me that he has seen trained soldiers go to pieces under arrow volleys, and has seen the same men attack a machine-gun without the turn of an eyelash. But to say that there are no safety hazards in archery is to attempt to dodge the facts.

Danger to Passers-by

Any danger to the general public is caused by careless planning or improper construction of the range. For at least twenty yards behind the targets the field should be kept open and clear. If twenty yards is all the space that can be allowed, it is best to fence it off with ¼-inch galvanized wire. The fence should be either 30 inches or 5 feet high, depending upon surrounding conditions. If an arrow should penetrate it, it will lose almost all of its energy. This is the kind of fence we used on one range where there was a group of tennis courts behind the archery range, and a path between. Sometimes a high bank can be found in front of which to set the targets. Such a backstop answers all safety requirements.

The sides of the range may also be fenced. This is seldom found necessary. The Lincoln Park Club in Chicago uses temporary ropes. The Washington Park Club, in the same city, has nothing at all on one side of the range, and dense shrubbery and a wall on the other. In one case, there is need to rope off the range, but not in the other, as there is no occasion for the public to cross in front of or behind the targets. Arrows that miss the target have spent their force after skidding along the ground, and even the rankest beginner doesn't miss over a couple of yards or so, and then almost always below the mark. The twenty-yard leeway behind the target is more than sufficient.

Wanton or Careless Shots

This is the most dreaded hazard of archery, and one which never occurs. Small boys of all ages like to shoot arrows straight up, but I have never seen a single wild shot loosed upon any target range. No archer of any experience at all would permit such conduct, knowing how such arrows may drift with the wind and fall almost anywhere. The shooting done by experienced archers on the range seems to educate the whole community, and all those who have bows get the idea of restraint by observation.

Injury to Archers on the Range

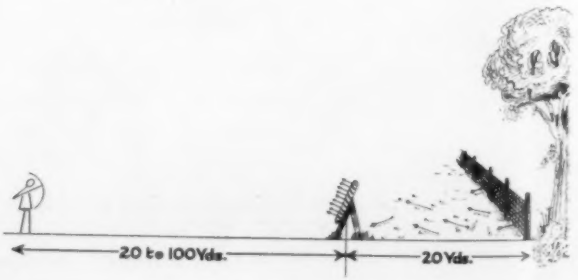
The only real hazard on the archery range is caused by one group of archers shooting at one target while others are drawing their arrows from an adjacent target. The only injury I have ever seen, and four of the other five I have heard of, were caused in this way. All of these were of slight importance as far as consequences were concerned. This hazard is inexcusable, because it could be prevented so easily. At all tournaments the archers shoot at one time, or in order, and then all go to the targets. No danger is present in this kind of shooting. It is during practice that accidents happen.

There are two ways of prevention. The first is by making a rule that no arrows may be retrieved while others are shooting. This is a very difficult rule to enforce—as some are sure to shoot their shafts much more quickly than others, and become impatient at being forced to wait.

The best method of prevention is wide spacing of the targets, at least during practice. This is easily done. Say that your range has five targets—spaced ten yards apart. There are usually fewer archers at practice hours, so that three targets will probably fill all requirements. Have the first, third and fifth targets set up, which would give twenty yards between targets. This is more than ample, because the worst of us never miss a target that far.

Danger signs can be used where necessary.

Archery is practical and safe in all but very small parks and in large playgrounds.



Memphis Opens Drive on Billboards in City and County

By HUGH RUSSELL FRASER

IN ONE of the most vigorous campaigns ever waged to secure the removal of unsightly and unnecessary billboards, Memphis and Shelby County, Tennessee, have taken sharp action to enforce their unique city and county zoning ordinance to the letter of the law.

Scores of signs have been torn down by agents of the County Board of Adjustment. Acting under the provisions of a special act of the Legislature which created a County Planning Commission and divided into five zones all area within five miles of the city limits, the Board of Adjustment sent out two trucks with the necessary equipment to remove all signs on the highways entering the city unless such signs were at least 50 feet back from the highway.

The City and County Zoning Ordinance

Under the terms of the zoning ordinance, all the area from the city limits for five miles beyond was placed in the following classifications: (a) residential, consisting mainly of subdivisions; (b) agricultural, mostly dairy and truck farms; (c) commercial, crossroad corner stores, etc.; and (d) unrestricted, or factory sites, etc., where bill posting was not limited.

The uniqueness of this ordinance consists in the fact that it affords the city and county ample means of protecting the nature of property which in the future will be brought within the city limits. While such control is naturally limited, its effect on city beautification is definite.

Chairman E. B. Klewer of the County Board of Adjustment announces that under the terms of this ordinance no permits for the erection of signs within 50 feet of the highways will be issued in the five-mile zone beyond the city limits.

Actual demolition of the existing signs encountered sharp opposition in some quarters. Generally, however, property owners and sponsors of the signs yielded when the terms of the ordinance were read to them. One of the first signs encountered by the crew of workmen under the direction of Mr. Klewer was one advertising jointly a night club and a beverage. The night club manager was informed that his sign was within 50 feet of the highway, and he at once agreed that it be taken down. Other signs along the main highways entering the city were torn off trees, fence-posts and even barns. One large sign, 25 feet x 14 feet, almost completely obscured a curve in the road. This came down in a hurry while the property owner—who had agreed to its erection—looked on.

About a mile from the city limits, it was found that the signs increased in numbers almost fifty per cent. They were summarily and systematically torn down. The truck carrying the workmen was equipped with large hooks, and in some cases the truck itself was used as motive power for pulling board construction down, a chain being fastened to the hook for that purpose. In many cases the signs were less than 200 feet apart.

A junk-yard owner became indignant when he was informed that under the terms of the ordinance he would have to erect an 8-foot fence around his property. He pointed to a 3-foot hedge which he had planted about the place and demanded that the county authorities wait until the hedge grew up the required height. As an extra inducement he promised to keep the hedge well fertilized. Board of Adjustment agents, however, pointed out that the law must be carried out and that he would be given only a reasonable length of time to erect the required fence. In addition, the junk-yard operator was instructed to move back, beyond the 50-foot limit from the right-of-way, several used cars which he had placed adjoining the right-of-way.

THE BILLBOARD WAR IN SHELBY COUNTY, TENNESSEE

1. An advertising company has been denied a permit to erect a large billboard on this beautiful wooded lot. 2. This sign broke into the attractive landscape, and has been removed. 3. The automobile junk yard has been ordered fenced in, and most of the billboards, which encroach on the highway, will be turned down or moved back

Cooperation of Property Owners—or Court Action

Under the terms of the ordinance, the five-mile zone beyond the city limits can be cleared of all signs erected without the consent of 75 per cent of the frontage owners within 1,320 feet of the sign, providing such signs are in

the agricultural zone, and all like signs in the industrial or unrestricted zone can be removed unless they were erected with the consent of a majority of the frontage owners. Of course, all signs encroaching on the right-of-way, or dangerous to public health or safety, are absolutely prohibited.

Chairman Klewer of the County Board of Adjustment declares that he may have to resort to court action to get rid of some of the larger signs. These large signs cannot be removed by ordinary equipment. They are built of steel and placed in a concrete base, costing in many instances between $600 and $1,000. Even in the case of these signs, however, the Board of Adjustment plans to go to any length to enlist the cooperation of the property owners. Only in the event that an unconditional refusal is given will court action be attempted.

Incidentally, the question of whether a state has a right to prohibit billboards "except of a prescribed size and location, or their use for certain kinds of advertising" has already been decided affirmatively by the Supreme Court of the United States in the case of *Nebbia v. New York*, 291 U. S.

Under the special Act of the Tennessee Legislature, passed in April, 1931, the control of billboards in the county for five miles beyond the city limits was prescribed, but thus far a court test has not occurred with reference to any of its provisions. The municipal zoning ordinance, however, under which the city of Memphis itself was divided into five zones, and the control or prohibition of billboards specified, has already been tested in the courts and has been upheld (*Spencer Sturla v. City of Memphis*, 1925).

Billboard Control by the Municipal Zoning Ordinance

A special effort is being made to strictly enforce the provisions of this ordinance. Signs of any kind are absolutely prohibited in Zone A, the residential section. In Zone B, the apartment district, consent of the owners of 75 per cent of the frontage on both sides of the street in the block in which the sign or billboard is to be erected must be obtained before a permit for its construction is authorized. In Zone C, the retail district, consent of the owners of a majority of the frontage must be obtained before a permit can be secured.

In the residence area, certain types of signs—such as those of physicians, dentists, artists, etc.—are permitted. And even in these instances, the size is kept down to a name plate not exceeding one square foot in area.

There are four organizations in the city and county keeping an eye on the billboard problem—the city and county zoning committees, and the County Board of Adjustment and the City Board of Adjustment. The last-named seek to prevent the zoning regulations from becoming confiscatory in specific cases. Outstanding citizens are drafted to serve on the City and County Planning Commissions as well as on the City and County Boards of Adjustment. Only the Secretary and Engineer, Lawrence P. Cockrill, is a paid official.

The drive on unsightly and illegal billboards in the city and county has been under the general direction of Chairman E. B. Klewer, who has had the consistent support of Commissioner E. W. Hale, Mayor Watkins Overton, and the *Memphis Press-Scimitar*.

Child Health Protection Work in New Jersey*

By **DR. JULIUS LEVY**
Director of Child Hygiene, New Jersey State Department of Health

THE establishment and maintenance of child hygiene work in the state of New Jersey has been due largely to the influence of women's groups. The plan on which the work is now conducted by the New Jersey State Department of Health was developed directly after the World War. There are now 146 child hygiene nurses in 475 communities under the technical supervision of the State Bureau of Child Hygiene. Of this number, 129 are paid by municipalities, which contribute about $200,000 a year, while the state contributes $100,000. This work has been developed largely as the result of demonstrations established by the State Bureau.

In 1918 the infant mortality rate was 112; that is, for every thousand babies born, 112 died before they were one year old. In the year 1933 the infant mortality rate was 46, a little more than one-third of what it was fifteen years ago. If the infant mortality rate of 1918 had obtained in 1933, approximately 3,600 more babies would have died. At the beginning of this organized work the summer months were a serious menace to infant life, July and August showing a great increase in sickness among infants and great peaks in mortality. Today, summer is the safest time for any infant in the state of New Jersey, for July presents the lowest mortality of any of the months for infants under one year.

During the last four years we have been able not only to maintain the low infant mortality but to make further progress. The year 1933 showed the lowest infant mortality ever reported in New Jersey and the lowest mortality reported by any of the Eastern States. We are not justified in interpreting this fact as evidence that the depression has not caused serious injury to our children. When we remember, however, that this reduction in mortality is the result of education in the care, management and feeding of infants and pre-school children, we have every reason to accept it as an indication that the nutrition, health and vigor of the surviving children are being maintained also.

The Education of Mothers

The characteristic feature of child hygiene work in New Jersey has been its emphasis on the prevention of morbidity and mortality in early life through education of mothers. We believe that through carefully thought-out and organized educational and relief work, which provides families with all the essentials in foods and teaches mothers the proper selection and preparation of such foods, the health of children can be so maintained that there is no need for sporadic efforts.

When attention was first directed to the many defects and deformities found in school children, it was thought that one effective way of dealing with this problem was to develop nursing, medical and nutrition work in the schools. A study of the diseases, defects and deformities quickly indicated, however, that their prevention could be accomplished only in a small way by any work carried out in school or with school children, and that even their correction did not accomplish as much as was expected. Malnutrition manifests itself long before the child comes to school, and the only effective time for influencing normal growth, development and nutrition is in the early infancy period. The rapid processes of growth during infancy and early childhood and the relationship of early nutrition and environment to the health and efficiency of the school child give new impetus and value to preventive hygiene work.

* From a recent radio talk over Station WOR, for the New Jersey League of Women Voters.

The New Edgerton Sewage Works Help Clean Up Rock River Valley

By W. G. KIRCHOFFER

Hydraulic and Sanitary Engineer,
Madison, Wis.

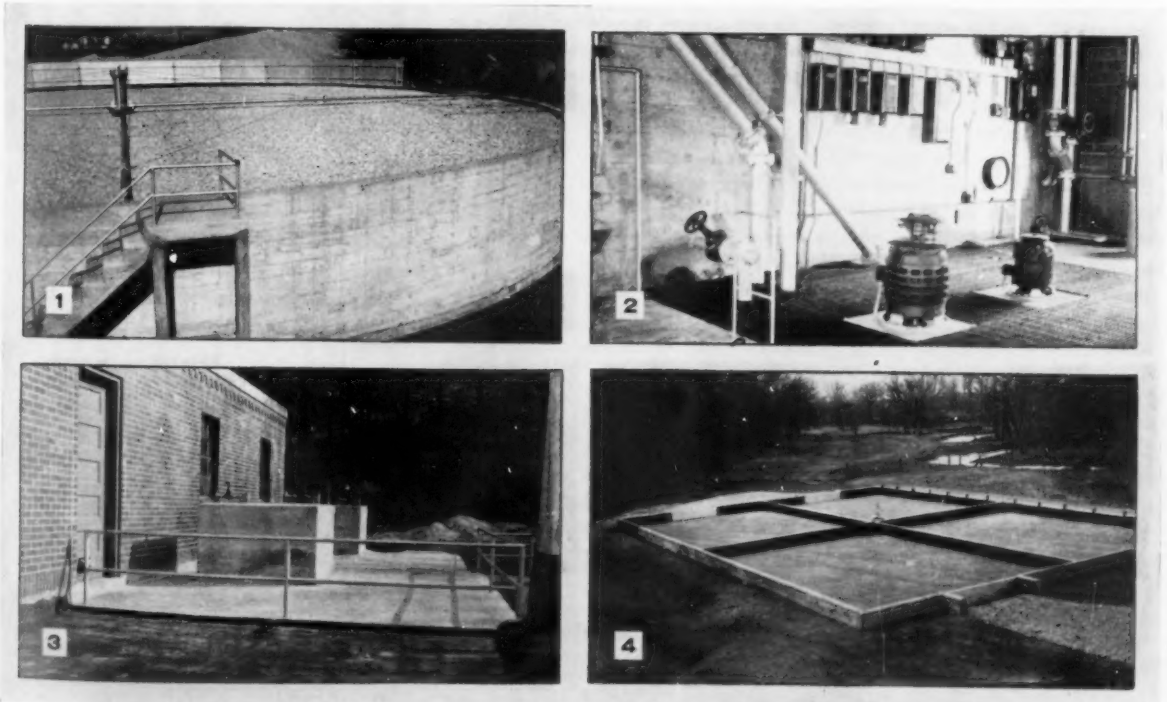
THE new sewage disposal plant in the city of Edgerton, Wis., under construction last year, has been completed and recently put into operation. This plant is not merely a series of tanks, but is more like an industrial plant in which a real mechanical process or operation takes place. It is located in the valley of Saunders Creek, directly south of the Edgerton Sand and Gravel Company's plant.

Before the sewage enters the plant a fixed bar screen removes rags, etc. Because the old main sewer, which is still used, is about 5 feet below ground and the creek often floods this area, it is necessary to pump the sewage into the plant, and the plant was therefore built on higher ground above flood level.

THE BUILDING HOUSING THE PUMPS AND OPERATING EQUIPMENT

The plant is of the separate sludge digestion type, with sprinkling filters. The sewage first flows into a receiving pit, from which it is pumped by two specially designed non-clog vertical sewage pumps into the primary clarifier tank. The pumps are located in a pit 12 feet deep and 4 feet below high sewage level, so that they are always primed. They operate automatically, and, by means of a clever device designed by the engineer, they have a capacity ranging from 100 gallons per minute up to 400 gallons per minute. This device automatically selects the pump best suited to the flow of sewage and is operated at proper speed to care for the flow. A chart on an automatically recording meter tells the operator how much sewage is pumped per minute.

The pumps deliver the raw sewage to the primary clarifier tank, where the coarser and heavier solids are settled out, a purely physical and mechanical process. Within



VIEWS OF THE NEW SEWAGE TREATMENT PLANT AT EDGERTON, WIS.

1. The circular sprinkling filter with its revolving distributor arms. 2. The motors and electrical equipment. 3. The digester, showing the gas domes. 4. The sludge drying beds

this tank is the power-driven clarifier which collects all of the settled solids in a hopper at one end of the tank, from which they are pumped to the digestion tanks. Any scum floating on the surface of the water is scraped to a scum trough, and is delivered to the digesters by the sludge pump. From the collection chamber at the end of the clarifier tank the clarified sewage goes to the sprinkling filter.

The Sprinkling Filter

The sewage is sprayed over a circular area of crushed stone 90 feet in diameter by 8 feet deep. The spraying is done by revolving arms driven by the force of the fluid flowing out of the orifices in the distributor arms. This filter acts very much as a lung does in aerating blood. The sewage flows down through the stone, and the air flows up through it, supporting millions of minute animal and vegetable organisms that perform the act of clarifying the sewage.

From the filter the clarified sewage is collected by the underdrains and flows to a final clarifier tank under the main plant. The purpose of this final clarifier is to settle out any solids that "slough off" the stone in the filter. These solids are collected into a hopper at one end of the tank in the same manner as in the primary clarifier. From this final clarifier the effluent flows to the creek for disposal in the Rock River.

Disposal of Solids

The solids from both of the clarifiers take quite a different course through the plant. They are stored in the digestion tanks for a period of three to four months, during which time the process of digestion by bacterial action takes place. In the decomposition of these solids, large quantities of gas are generated and liberated.

Much of the gas is combustible, being largely methane or marsh gas. It has been found that heat aids and speeds up the process of digestion, so the gas is collected in gas domes and piped to a gas-burning hot-water boiler. The hot water thus produced is circulated by a small pump through coils in the bottom of the digester. In addition to the gas boiler there is provided a hot-water coal-fired boiler to be used during cold weather when more heat is required and when the gas production is low. This coal-fired boiler also heats the buildings over the control room and over the primary clarifier. The hot water is circulated through a unit heater which blows the hot air about the room. The upper room over the primary clarifier is heated by a fan blowing hot air from the lower room up into it. A thermostat in this upper room controls the temperature and operation of both the fan and the unit heater.

When the sludge has been in the digesters a sufficient length of time to be thoroughly digested, which tests will show, it is drawn off onto sludge beds where the water drains out of it, as it is about 90 per cent liquid, and then dries. This sludge can be used for fertilizer or for the filling-in of low ground.

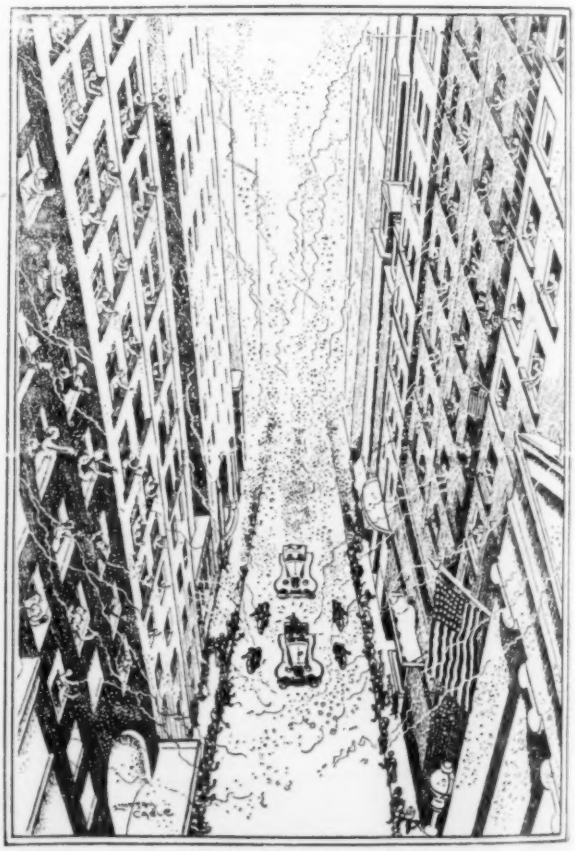
The plant is kept in proper operation from a physical, mechanical and bacteriological standpoint by some simple physical and chemical tests which the operator performs frequently.

John Findorf and Son, of Madison, built the new sewage treatment plant; Fairbanks-Morse Co. supplied the pumps; Link Belt Co., the clarifiers; Grinnell Co., the pipe and fittings; Rensselaer Valve Co., the valves; Pacific Flush Tank Co., the circular distributor for the filter; the C. A. Hooper Co., the heating equipment; and the General Electric Co. supplied the motors and switchboard equipment. W. G. Kirchoffer designed the plant and superintended its construction. Lawrence Curran, of Edgerton, acted as resident engineer and assisted in putting the plant into operation. The plant is now operated by John Collins, who also is responsible for the operation of the city water works.

EDGERTON, WIS., SEWAGE DISPOSAL PLANT
ESTIMATE AND FINAL COST

	Engineer's Estimate	Bids Received	Final Cost
Construction and Installation of Equipment..	$16,341.00	$14,914.00	$15,217.03
Valves	600.00	586.72	641.22
Pipe and Fittings.....	1,300.00	1,420.91	1,528.11
Sewage Pumps.....	1,400.00	986.00	986.00
Sludge Pump.....		540.00	540.00
Clarifiers	2,500.00	2,065.00	2,065.00
Circular Distributor ...	1,600.00	1,525.00	1,525.00
Heating Equipment....	550.00	340.00	346.50
Meter	0	55.96	56.19
Rock for Filter	4,750.00	3,753.00	3,753.00
Placing Rock for Filter		1,140.00	1,140.00
Small Piping & Plumbing	0	0	144.51
Electric Wiring & Meter	300.00	0	119.95
Heating & Ventilating.	0	0	171.95
Totals	$29,341.00	$27,326.59	$28,234.46

Must We Continue to Honor Our Heroes by Littering Our Streets?



ENGLAND CHIDES US
A cartoon which appeared in *Punch*, with the title, "America Greets the President of the Anti-Litter League

Water Rates and Service Charges, Installation Charges, Hydrant Rentals and Sprinkler Costs—III

Abstracts of Water Department and Company Reports

Worcester, Mass.

Population	194,000
" served	195,300
Number of services	29,818
" " water meters	28,655
" " hydrants	3,389
Miles of main	400.998

The rates charged for metered water in Worcester include a minimum charge of $3.00 for each 6 months. For the first 10,000 cu. ft. or less the charge is 18c per 100 cu. ft., while for all water used over the first 10,000 cu. ft. and equaling 667 cu. ft. daily the charge is 14c per 100 cu. ft. This rate is figured on each piece of property separately, and no grouping of bills is permitted. For all excess over the 10,000 cu. ft. and equaling 1,334 cu. ft. daily, the charge is 9c per 100 cu. ft. through one meter only. For any quantity of water used exclusively for manufacturing purposes and paid for by the manufacturer, the rate is 9c per 100 cu. ft. Water used by city departments is charged at the rate of 9c per 100 cu. ft. For water used by institutions of a religious, charitable, educational or hospitalization purpose, the rate is 9c per 100 cu. ft.

LEON A. GOODALE,
Water Commissioner and Registrar, City Water Department.

Ogden, Utah

Population	40,000
" served	40,000
Number of services	9,000
" " meters	3,075
" " hydrant	327
Miles of water mains	111

The monthly minimum charge for water used through a meter is 75c for all sizes of meters. The general meter rates are as follows:

From	0 to	50,000	"	16c per 1,000 gals.
"	50,000 to	100,000	"	12c " " "
"	100,000 to	500,000	"	10c " " "
"	500,000 to	1,000,000	"	8c " " "

Over 1,000,000 gals. 6c per 1,000 gals.

No monthly charge for water used through a meter is made at the rate given which will exceed the minimum amount on a lower rate, which could be available through a larger consumption. A discount of 5% is allowed on meter bills paid within 10 days from date of billing.

Private fire plugs or attachments such as sprinkler systems for extinguishing fire only are billed at $3.50 per year per plug or attachment.

H. F. IRWIN,
Superintendent, Water Department.

Kingston, N. Y.

Population	28,500
" served	28,000
Number of services	7,200
" " meters	390
" " hydrants	650
Miles of water main	105

The minimum meter rate per quarter is $5.00 and the regular rates are as follows:

For	1,500	cu. ft.	or any portion	thereof	in each quarter	$3.00
Next	3,500	"	"	"	"	" at $1.75 per 1,000 cu. ft.
Next	5,000	"	"	"	"	" " 1.25 " " " "
Next	10,000	"	"	"	"	" " .80 " " " "
Next	20,000	"	"	"	"	" " .50 " " " "

Meter bills are payable quarterly on the first days of January, April, July and October, and 10 per cent is added if not paid on or before the 20th of the month in which the bills are rendered.

WILLIAM D. CASHIN,
Superintendent, Kingston Water Works Department.

Keene, N. H.

Population	13,774
" served	13,636
Number of services	3,000
" " meters	2,852
" " hydrants	391 public 28 private
Miles of water main	58.67

The quarterly meter rates are as follows:

First	500	cu. ft.	or any part	thereof		$1.50
Next	9,000	"	"	"	"	.17 per 100 cu. ft.
"	9,000	"	"	"	"	.12 " " "
"	9,000	"	"	"	"	.10 " " "
"	9,000	"	"	"	"	.07 " " "
"	9,000	"	"	"	"	.05 " " "

All over 45,500 cu. ft., $0.03 per 100 cu. ft.
Provided, however, that in no case shall the quarterly charge be less than $1.50.

The Water Department makes all connections and furnishes and lays all pipe for service connections. The charge for a ¾" tap and ¾" pipe to the street line is $11.00. From the street line to the cellar the charge is 40c per foot, with a ¾" lever handle stop and waste cock furnished for $1.65. A charge of $12.00 is made for a ¾" and 1" pipe to the street line, with an additional charge of 45c per foot from the street line to the cellar, and a charge of $2.50 for a 1" lever handle stop and waste cock. A charge of $13.50 is made for a 1" tap and 1" pipe to the street line, with an additional charge of 45c per foot from the street line to the cellar, and $2.50 for a 1" lever handle stop and waste cock. A charge of $15.00 is made for a 1" tap and 1¼" pipe to the street line, with an additional charge of 40c per foot for pipe from the street line to the cellar and $4.00 for a 1¼" wheel valve. No tap is made larger than 1" except by special permission and with a proportionate additional charge for stock and labor. From the mains to the street line in cement and brick paved streets the cost of pipe and labor is added.

No charges are made for public or private fire hydrants or for private sprinkler systems for fire protection.

P. F. BABBIDGE,
Superintendent, Keene Water Works.

Newark, N. J.

Population	440,000
" served	440,000
Number of services	71,482 low pressure 300 high "
" " meters	53,906 low " 117 high "
" " hydrants	4,257 low " 380 high "
Miles of water main	532 low " 28 high "

NOTE: High pressure is for fire system.
Low pressure is for general use.

Unless the water is shut off by the Division of Water and remains so for a full quarter of a year, a minimum charge of $6.00 per year, or $1.50 quarterly, is made, whether water is consumed or not, and on this amount there is no discount allowed. The high-pressure minimum charge for general use is $8.00 per year, or $2.00 quarterly. This charge entitles the consumer to the use of 500 cu. ft. of water per quarter. Water consumed in excess of the first 500 cu. ft. per quarter is charged at the rate of $1.00 per 1,000 cu. ft. The high-pressure service costs $1.33 1/3c per 1,000 cu. ft. Effective September 1, 1933, a 15% surcharge was added to these rates.

When bills are paid within 30 days from the first day of the quarter for which they are rendered, the following discounts are allowed on the charges for metered water: 2% for each $100.00 annual payment; 4% for each $200.00; and so on until $2,000.00, or the maximum discount of 40%, is attained. Ap-

proximations of discounts, based on the previous year's consumption, are made on quarterly bills when the annual payment amounts to $600.00 or more. The entire discount on all metered bills is adjusted and credited in February of each year.

The following charges are made for private fire services, there being no charge for public fire hydrants:

	Metered Per Year	Not Metered Per Year
2" tap service	$ 7.50	$15.00
2" tap high service	25.00	50.00
2" combined high and low service unless taken from larger service	25.00	50.00
4" tap low service	7.50	15.00
4" tap high service	50.00	100.00
4" combined high and low service	50.00	100.00
6" low service	7.50	15.00
6" high service	75.00	150.00
6" combined high and low service	75.00	150.00
8" tap low service	12.50	25.00
8" tap high service	100.00	200.00
8" tap combined high and low service	100.00	200.00
Each yard fire hydrant (unmetered)		15.00

The 15% surcharge mentioned above for domestic rates does not apply to fire line services.

W. B. BANK.
Division Engineer, Water Department.

Dallas, Texas

Population	275,000	
" served	275,000	
Number of services	70,000	(approximately)
" " meters	60,650	
" " hydrants	3,303	
Miles of water main	619.178	

The minimum monthly rate for all metered water service within the city limits is as follows:

For	5/8" meter	$ 0.50	net
"	3/4" "	1.00	"
"	1" "	1.50	"
"	1 1/2" "	3.00	"
"	2" "	5.00	"
"	3" "	10.00	"
"	4" "	15.00	"
"	6" "	25.00	"
"	8" "	37.50	"
"	10" "	50.00	"

The following rates are charged for water actually used:

First	8,000 gals.	@	$0.260	net per M gals.
Next	2,000 "	@	0.250	" " " "
"	5,000 "	@	0.244	" " " "
"	45,000 "	@	0.240	" " " "
"	10,000 "	@	0.210	" " " "
"	30,000 "	@	0.200	" " " "
"	400,000 "	@	0.180	" " " "
"	500,000 "	@	0.170	" " " "
"	500,000 "	@	0.140	" " " "
"	500,000 "	@	0.120	" " " "
"	1,000,000 "	@	0.100	" " " "
"	17,000,000 "	@	0.090	" " " "

Where a consumer uses more than 20,000,000 gallons per month through one meter, the entire consumption is billed at the straight rate of 9c per thousand gallons.

For all commercial and industrial uses, consumers are billed at the rates given above. In cases, however, where commercial or industrial users operate continuously in such a manner as to provide a uniform load on the water system, the consumer may be billed at a monthly rate of $200 net where he has not used sufficient water in one month to incur a bill equal to $200 at the metered rate. He may receive the first 1,000,000 gals. for the sum of $179.70 net, and all water used in excess of 1,000,000 gals. per month at the rate of 7c net per thousand gallons. This special rate applies only where the consumer uses city water as a major supply. The minimum monthly rate for domestic use outside the city limits is as follows:

For	5/8" meter	$ 1.00	net
"	3/4" "	1.50	"
"	1" "	2.25	"
"	1 1/2" "	4.50	"
"	2" "	7.50	"
"	3" "	15.00	"
"	4" "	22.50	"
"	6" "	37.50	"
"	8" "	56.25	"
"	10" "	75.00	"

The schedules of charges listed above are net, and apply on all monthly bills when paid within the time provided for the payment of such bills. After the delinquency date, which is printed on the statement, a penalty of 10% is charged.

All water furnished to the various departments of the city is measured by meter at the discretion of the Superintendent of Water Works, and all water used and measured by meter is paid for by the respective departments from their budgeted funds.

Meters for services within the corporate limits of the city are furnished, installed and maintained by the city water works with the exception of those on services non-productive of revenue or in cases where the consumer is enjoying a special rate. On all such services the meters, meter box, and all necessary valves, fittings, etc., are furnished and maintained at the consumer's expense.

When an application for water service is made, the owner is required to make a deposit as shown in the two schedules below for property inside and property outside the corporate limits.

The charge for the maintenance of fire hydrants and water used through fire hydrants for the purposes of extinguishing fires by the city fire department are $3.00 per month for each hydrant in service and connected with the city main. This charge is made against the Fire Department funds.

No connections for private sprinkler or fire service are permitted without the installation of a meter or a detector check with a by-pass meter, except on alarm or closed systems, and only after application has been made and granted. The furnishing, installation and maintenance of all meters, checks, by-passes, valves, pipe, etc., necessary for the installation and operation of sprinkler systems and fire services, are at the expense of the consumer.

Where property is located on a street in which there exists no water main in the street or alley contiguous to the premises, the Water Department may extend the nearest water main in the direction of the premises, provided that in no instance the extension exceeds 100 ft. for any one service; except that the Water Department may estimate the cost of such extension in excess of 100 ft. and upon payment by the applicant of such estimated extension costs, the extension may be installed. The Department may make an extension without cost where at least 60% of the property would be served, provided that the extension will show an income of at least 10%, assuming a 54-cent minimum bill for each account of the line.

J. B. WINDER,
Superintendent, City Water Department.

In the June Issue

appeared reports in this series from **Ames, Iowa; Anniston, Ala.; Burlington, N. J.; Cedar Rapids, Iowa; Columbia, S. C.; Corvallis, Ore.; Dodge City, Kans.; Jackson, Miss.; Hanover, Pa.; Indianapolis, Ind.; Jonesboro, Ark.; Manitowoc, Wis.; New Castle, Ind.; Olympia, Wash.; Rapid City, S. Dak.; Rochester, Minn.; Salt Lake City, Utah; Washington, D. C.; Wilmington, Del.; Winona, Minn.; Wausau, Wis.; Yonkers, N. Y.**

INSIDE CORPORATE LIMITS

For property and/or person served by	5/8" water meter	$ 3.00	min.
" " " " " " "	3/4" " "	4.00	"
" " " " " " "	1" " "	6.00	"
" " " " " " "	1 1/4" " "	7.50	"
" " " " " " "	1 1/2" " "	12.50	"
" " " " " " "	2" " "	20.00	"
" " " " " " "	3" " "	30.00	"
" " " " " " "	4" " "	40.00	"
" " " " " " "	6" " "	50.00	"
" " " " " " "	8" " "	60.00	"

PROPERTY OUTSIDE CORPORATE LIMITS

For property and/or person served by	5/8" water meter	$ 5.00	min.
" " " " " " "	3/4" " "	7.00	"
" " " " " " "	1" " "	10.00	"
" " " " " " "	1 1/4" " "	15.00	"
" " " " " " "	1 1/2" " "	25.00	"
" " " " " " "	2" " "	35.00	"
" " " " " " "	3" " "	45.00	"
" " " " " " "	4" " "	60.00	"
" " " " " " "	6" " "	75.00	"
" " " " " " "	8" " "	90.00	"

These deposits are returned with accrued interest at the rate of 6 per cent when service is discontinued and all indebtedness paid. The city water works installs and maintains all service connections in the streets and alleys within the corporate limits of the city, and charges for such installations and for maintenance at the following rates:

COST OF SERVICE CONNECTIONS

3/4"	service in dirt or gravel street or alley	$15.00
1"	" " " " " "	20.00
3/4"	" that has been placed in advance of paving	20.00
1"	" " " " " "	25.00
3/4"	" where paving must be cut	26.50
1"	" " " " "	30.00
3/4"	bullhead off existing service	5.00
1"	" " " "	8.00

Mobile, Ala.

Population	70,916
" served	.....
Number of services	19,846
" " meters	19,844
" " hydrants	1,416
Miles of water main	291.2

The minimum bill under the meter rate is $1.12 per month, for which there is allowed a consumption of not exceeding 3,750 gals. All water consumed in excess of this amount is charged at the following rates:

25,000 gals. or less per month	30c	per 1,000 gals
25,000 to 50,000 gals. per month	25c	" " "
50,000 to 75,000 " " "	20c	" " "
75,000 to 100,000 " " "	18c	" " "
100,000 to 500,000 " " "	16c	" " "
500,000 to 1,000,000 " " "	15c	" " "
1,000,000 to 2,000,000 " " "	13c	" " "
2,000,000 to 3,000,000 " " "	10c	" " "

Over 3,000,000 gals.—rate to be fixed by special contract with the city.

There is no charge for public fire hydrants, the rates for private fire hydrants being as follows:

For the first three	$30.00	each per year
" " next "	22.50	" " "
" " " "	18.50	" " "
In excess of nine	15.00	" " "

All automatic sprinkler systems are billed at $6.00 per year. All bills for service at meter rates are payable between the 1st and 10th days of each calendar month, and flat rates on fire hydrants and sprinklers are payable semi-annually in advance between the 1st and 10th days of May and November, respectively.

T. C. White,
Superintendent, Water Works Department.

Ottumwa, Iowa

Population	28,000
" served	27,500
Number of services	4,500
" " meters	4,500
" " hydrants	526
Miles of water main	58.8

The minimum rate to consumers using meters is 75c per month. The water rates are as follows:

Up to 30,000 gals. per month	25c per 1,000 gals.
30,000 to 50,000 " " "	20c " " "
50,000 to 175,000 " " "	15c " " "
175,000 to 300,000 " " "	12½c " " "
300,000 to 2,000,000 " " "	10c " " "
2,000,000 to 6,000,000 " " "	8c " " "
6,000,000 or more " " "	6½c " " "

There is no charge for public fire hydrants. The charge for private fire hydrants is $15.00 per year per nozzle.

The minimum charge for sprinkler heads is $60.00 per year on a 6" connection, the charge per sprinkler head being 6c per year.

Horace A. Brown,
Superintendent, Ottumwa Water Works.

Pittsburgh, Pa.

Population	688,000
" served	600,000
Number of services	109,282
" " meters	50,317
" " hydrants	8,560
Miles of water main	855

All water is supplied at metered rates in the city of Pittsburgh and is billed at the following rates per quarter year:

First 250,000 gals. or less	20c	per 1,000 gals.
Second 250,000 " " "	18c	" " "
Third 250,000 " " "	16c	" " "
Fourth 250,000 " " more	14c	" " "

Hospitals, dispensaries and other charities supported by public and private contributions are charged at the rate of 7c per 1,000 gals., except that hospitals supported by public charity receive free of charge 250 gals. of water per person per day, and schools supported by private charity receive free 2,500 gals. of water per pupil per year. Hospitals and charitable institutions operating and maintaining laundries for commercial purposes or operating hydraulic producing machinery must pay the usual and fixed rate for all water used for such purposes, and must maintain separate water lines for services which are separately metered.

For all water taken the rate for which is not specifically provided, and which is not measured by meter, the quantities are estimated and charged for at the above metered rates, provided that in no case where metered water rates are in force shall the charge for such premises for each quarter be less than the amount specified in the following schedule:

25c per quarter for	1- and 2- room dwelling house premises
50c " " "	3- " 4- " " " " "
$1.00 " " "	5- " 6- " " " " "
$1.25 " " "	7- " 8- " " " " "
$2.00 " " "	9- " 10- " " " " "
$2.50 " " "	11- " 12- " " " " "
$3.00 " " "	13- " 14- " " " " "
$4.00 " " "	15- " 16 " " " " "
$5.00 " " "	dwelling house premises of more than 16 rooms

For all premises not included in the above schedule, the minimum charge is 2½% of the yearly flat assessment per quarter, excepting in each case where a property is equipped with an auxiliary water supply consisting of a pumping engine of not less than 50,000 gals. per day capacity and a reserve tank of not less than 3,000 gals. capacity, the minimum charge for each quarter shall be as follows:

For each ⅝" meter	$ 2.00
" " ¾" "	3.00
" " 1" "	5.00
" " 1¼" "	7.50
" " 1½" "	10.00
" " 2" "	12.50
" " 3" "	20.00
" " 4" "	30.00
" " meter larger than 4"	50.00

All meters are furnished by and at the expense of the property owner and are installed under the direction of the Bureau of Water. They are tested, repaired and replaced by the Department of Public Works, for which service a quarterly levy is made as follows:

⅝" x ⅝" x ¾" meter	$ .50	per quarter
¾" "	.75	" "
1" "	1.00	" "
1¼" "	1.25	" "
1½" "	2.00	" "
2" "	3.00	" "
3" "	6.00	" "
4" meter	11.00	per quarter
6" "	20.00	" "
8" "	40.00	" "
10" "	60.00	" "

All charges to metered water consumers are subject to a discount of 2% if paid within 10 days from the date of the bill; are payable at the face if paid within the next 10 days and if not paid within 20 days after the date of the notice, are subject to a penalty of 2% additional plus ½ of 1% for each month or part thereof that the bill is not paid.

No charge is made for water used during fires. All water used through fire systems except during fires is charged for at meter rates. All fire systems are metered except sprinkler head systems, and the minimum charge for each quarter is as follows:

2" and 3" meters	$ 2.00 per quarter
4" meters	3.00 " "
6" meters and over	4.50 " "

Wm. C. Donnan,
Division Superintendent, Pittsburgh Water Department.

Petersburg, Va.

Population	30,074
" served	28,074
Number of services	6,200
" " meters	6,200
" " hydrants	550
Miles of water main	85

The minimum charge for water per month is 80c, in addition to which the following meter rents are charged per month:

⅝" meter	$ .20 per month
¾" "	.30 " "
1" "	.40 " "
1½" "	1.00 " "
2" "	1.50 " "
3" "	2.50 " "
4" "	4.00 " "
6" "	6.00 " "

Water Rates

For 3,000 cu. ft.	or less, $2.00 per 1,000 cu. ft.
Over 3,000 " "	to 13,000 cu. ft., $1.00 per 1,000 cu. ft.
Over 13,000 " "	60 cents per 1,000 cu. ft.

Applications for water service are made to the Water Department, accompanied by full payment for the cost of the connection. The Water Department taps the main and installs the meter, which is set at a point close to the curb. The size of service pipe installed and the number of meters installed are determined by the Superintendent of Water Works. No tap of less than ¾" diameter is permitted, and no replacement is made less than ¾" pipe.

No rentals are charged for either public or private hydrants, and there are no charges for sprinkler service for fire protection.

Charles W. Davis, Jr.,
Superintendent, Water Department.

See the May Issue

for reports from Dayton, Ohio; Fort Wayne, Ind.; Jefferson City, Mo.; Milwaukee, Wis.; Mount Vernon, N. Y.; Spartanburg, S. C.

Modern Local Transportation—With the Trolley But Without the Track

The Trolley Coach Is Giving Swift, Quiet, Convenient, Economical Service

IN DAYTON, OHIO
The riding jumped from 30 to 40 per cent immediately after the trolley coaches were put into service

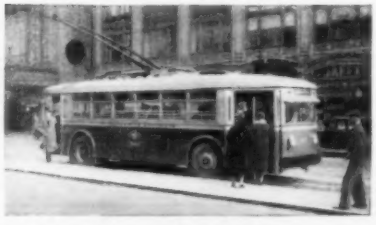
IN ROCKFORD, ILL.
Passengers do not have to fight their way to center of street

IN MEMPHIS, TENN.
Speed and revenue have both increased

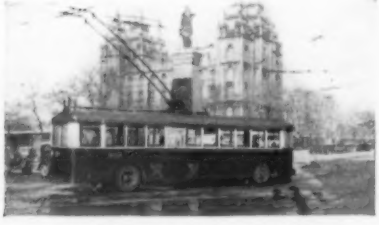
IN PAWTUCKET, R. I.
The public is pleased with the new system

IN ST. JOSEPH, MO.
378,000 miles without a service interruption

IN COLUMBUS, OHIO
The traction company and the Highway Department have abandoned the tracks



IN INDIANAPOLIS, IND.
This city has a fleet of 95 trolley coaches



IN SALT LAKE CITY, UTAH
A satisfactory record even in winter

IN SHREVEPORT, LA.
The citizens demand additional trackless trolley lines

IN CHICAGO, ILL.
The equipped trolley coaches in this city have been in service four years. Not a single motor failure in the first 419,000 miles of service

IN PEORIA, ILL.
Revenue from these coaches is reported as holding up well

IN TOPEKA, KANS.
The people prefer the trackless coach to the street cars

Illustrations by courtesy of General Electric Company

FORWARD STEPS

Reported by
Municipal Officials, Chamber of Commerce Executives, and Others

How Zoning Is Functioning in Johnstown

JOHNSTOWN, PA.—This city has had a zoning ordinance since January 5, 1926, and in May of that year the Zoning Administrator and the first Board of Appeals were appointed.

For a time, the zoning ordinance was more or less accepted by the people of the city. The years 1926-29 being real-estate boom years, every one was busy making money, so that not many complaints were heard in regard to the ordinance. But when the slump began, the builders, not having any better excuse, blamed zoning for retarding building locally. This idea was fought with success, by publishing a report of the amounts of building permits in valuation, granted and refused. Supplementing that with information as to what was happening in other zoned and unzoned cities in the country, the Zoning Administrator was able to show that the local zoning ordinance was not at fault; but that the country was at the beginning of a national economic depression.

At present, our zoning ordinance is functioning without any friction whatsoever, especially as it is generally known that I am willing to cooperate with prospective builders. When a builder applies for a permit, and I find that the way he contemplates building is contrary to the zoning regulations, I do not just tell him that he cannot get a permit; but instead I study his project, and endeavor to show him how, with some alterations, he can get what he wants to get and still comply with the ordinance. If the builder cannot make a comprehensive sketch or plat plan of what he wants to do, even that is done for him. For this reason, we seldom have to resort to any action of the Board of Appeals.

The Zoning Administrator in Johnstown is also the City Assessor. The issuing of zoning permits from the office of the Assessor is helpful in making assessments on new improvements, because of the building data obtainable in that way. The cost of administering zoning is very small in this city. The City Assessor, when also appointed Zoning Administrator, received an increase of $400 in salary. The office stenographer got a raise of $120 per year. The annual appropriation, about $100, makes the total cost some $620 per year.

I work in cooperation with the Fire Chief, and no permit is issued unless it is signed by him. In that way there is no danger of erecting a fire hazard in the fire zone.

Permits are limited to six months, thus preventing any one's doing building a year or two after the issuance of the permit. The Zoning Bureau issues a public bulletin each day, listing the permits granted, thus giving any one interested an opportunity to know what is going on. Over 4,000 permits, having a valuation of more than 6½ million dollars, have been issued since zoning was established in Johnstown. Only 17 applications have been refused, having a valuation of only $41,000. In the last three years we have refused only one permit, having a valuation of $300. Since the adoption of the zoning ordinance, only three cases have been appealed to court. The city won one and lost two.

SUMMARY OF ZONING PERMITS REFUSED AND GRANTED

Year	Total Number of Permits Issued	Total Number of Permits Refused	Total Valuation Permits Issued
1926.....	1,133	6	$1,934,644
1927.....	676	2	1,388,483
1928.....	564	4	1,096,119
1929.....	523	2	682,341
1930.....	415	2	695,920
1931.....	331	None	606,168
1932.....	217	"	140,187
1933.....	221	1	81,872
Totals.....	4,080	17	$6,625,734

Average percentage of value refused to date: .63 of 1%.

MICHAEL M. CHUDY,
Zoning Administrator.

For Side Views of Under-Water Swimmers

THE photograph below was taken during the construction of the swimming pool near Boreham Wood, not far from London, England. The sides of the pool are studded with large port-holes, through which bathers may be seen swimming beneath the water. The inside of the pool is shown, with the line of port-holes.

Paul's Photos

A POOL WITH PORT-HOLES

No Outside Relief Funds Needed

NEENAH, WIS.—The city of Neenah, the only municipality in Wisconsin not receiving state or Federal funds for relief, is conducting an unemployment relief program under the Street, Highway and Bridge Committee of the City Council. A blanket order was issued to the Committee by the City Council at a recent meeting to proceed with all available street repair and construction projects to provide immediate unemployment relief. The Committee is employing approximately 150 men with a payroll of $2,000 weekly. Men are worked on two five-hour shifts daily and given 30 hours' employment each week at 40 cents an hour.

Property in the city of Neenah has an assessed valuation of approximately $15,000,000, which includes more than 15 industries consisting of paper mills, foundries, stove manufacturers and woodworking plants. Two paper mills and the home offices of the Kimberly Clark Corporation, large paper and paper products manufacturers, are located in Neenah.

Neenah's per capita wealth is considered greater than that of any other city in the world. The exact figure cannot be determined because of the vast outside holdings of Neenah residents. The financial solidity of the city is well represented by the First National Bank, which has resources of nearly $3,500,000 and which does not accept county, state or Federal funds for deposit.

The city's peak unemployment period showed a maximum number of approximately 300 persons without work. City funds have been so administered that

HOW 3 MAINTAINERS DO WORK OF 4

Goodrich Z-P Pneumatic Tires Cut Machinery Operating Costs 20% to 30%

● Three more maintainers on Z-P Pneumatic tires for the City of Akron! These tires can't puncture—can't go flat. They carry no air pressure. Yet they are not solids. Goodrich Z-P Pneumatics are built on a new principle of tire construction. A giant air cavity underneath the big cleat tread cushions the load, eliminates the bouncing action of air pressure tires. You get 25% more power—save 18% to 20% on gasoline and oil!

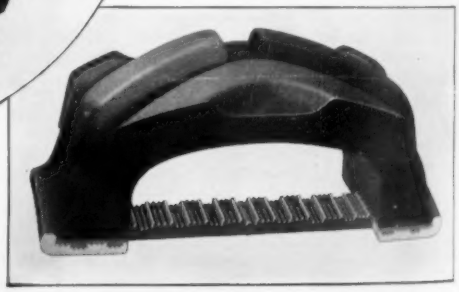
● Mud holds no terrors for Z-P (Zero Pressure) Pneumatics. This Austin No. 10 Hydraulic Controlled Grader travels through clay and mud without slipping. The lug type self-cleaning tread has 30% more traction! That's the kind of tire that gets work done in a hurry.

● On soft ground or sand, an air pressure tire digs in, tends to bury itself, requires more power to move the load. Efficiency is low.

● A Z-P Pneumatic pushes the soil under it, packs it down, actually forming its own track as it goes. No sinking. No spinning. Tread is self-cleaning.

● Read what Bruce Short, Surveyor and Engineer, Marion County, Indiana, says about Zero Pressures:

"The tractive quality of these tires was so outstanding that we conducted some severe tests of our own in an attempt to stick this job in the worst kind of clay in the country. The rear wheels were mired in to the hubs and stopped. The start was made without the slightest hesitation and with absolutely no slippage whatever."



THIS TIRE CAN'T GO FLAT

End tire troubles on graders, mowers, maintainers and tractors. Get the Goodrich Z-P (Zero Pressure) Pneumatic—the tire that can't go flat. It gives greater traction—eliminates punctures and blow-outs—stops bouncing—reduces tractor upkeep—cuts gas and oil costs—outwears air pressure tires—costs less.

See your Goodrich truck tire dealer or write for complete information on changeovers . . . Address Dept. Z-54, The B. F. Goodrich Rubber Company, Akron, Ohio.

Goodrich Z-P ZERO PRESSURE Pneumatic Tires

SPECIFY Z-P PNEUMATICS ON ALL YOUR NEW EQUIPMENT

there is more than $50,000 still available for current relief expenditures during the remainder of 1934.

It has been announced by H. C. Christoph, Chairman of the Committee, that considerable civic improvement is being accomplished through the present program. The amount and quality of work being done, it is stated, are superior to the majority of CWA projects.

ART J. HALAK.

Trees Keep a Sand Dune from Moving About

A GREAT deal of trouble had been experienced for many years with the eroding antics of Old Bald Head Mountain, a 300-foot high sand dune near Saugatuck, Mich. The constantly shifting winds tended to erode the wide areas of the dune, and the sands were gradually encroaching on the channel of the Kalamazoo River as well as threatening to destroy cottages at the base of the dune.

THE SHIFTING SANDS OF THIS HIGH DUNE IN SAUGATUCK, MICH., ARE NOW UNDER CONTROL

It was considered safe to erect the wooden stairway to the summit

Several years ago a large number of trees such as black locust, honey locust, white, Norway, jack and pitch pines were planted. To aid in holding the sand in place, several carloads of brush were hauled up the sides of the dune by cable and spread between the seedling trees. A high percentage of the trees have survived, natural weed growth has sprung up, and the dune is now under control. The tree and weed growth have had such a marked effect in keeping the sand in place that recently a wooden stairway has been built by residents of the town on the lee side of the dune so that visitors may easily reach the summit for a splendid view over the waters of Lake Michigan.

ALLEN P. CHILD.

State Parkway System Planned for Minnesota

MINNESOTA now has the legal machinery for designating a state parkway system, according to an announcement by N. W. Elsberg, State Highway Commissioner. Roads connecting a trunk highway with a public park or recreational center outside the limits of boroughs, villages or cities are eligible for inclusion in the parkway system. Parkway roads can be picked by county boards, subject to the approval of the Commissioner of Highways and the Commissioner of Conservation.

When officially designated as a state parkway, a road becomes eligible to receive both state aid and county aid benefits, at the discretion of the local board of county commissioners. Parkways are the only roads which can be both state aid and county aid highways. State aid roads receive the proceeds of the state 1-mill road tax, while county aid roads receive one-third of the state gasoline tax. Said Commissioner Elsberg:

"We hope that eventually we will be able to show on our state highway maps a distinctive parkway system covering the whole state, and leading both Minnesotans and tourists to public recreational spots in the various counties. The county projects can be linked up by classifying certain state trunk highways as parkways. A parkway system would tend to separate pleasure and commercial traffic to some extent and thus make for the safety and greater enjoyment of the public. If any counties do not have public parks or recreational centers at the present time, this opportunity may encourage the donation of beauty spots for public use, or their acquirement by other means."

Laws authorizing the establishing of state aid parkways in the counties were enacted by the special session of the Legislature. In general, such roads will be subject to the same laws as state aid roads, but some special requirements and standards may be set up by the Highway Department.

TYPE OF HIGHWAY, PRIMARILY SUITED FOR PLEASURE DRIVING, WHICH WILL BE INCLUDED IN THE NEW MINNESOTA PARKWAY SYSTEM

SAVE

on gasoline . . . on oil and upkeep with

CHEVROLET

VALVE-IN-HEAD 6-CYLINDER

TRUCKS

The Most Economical Truck You Can Buy

CHEVROLET

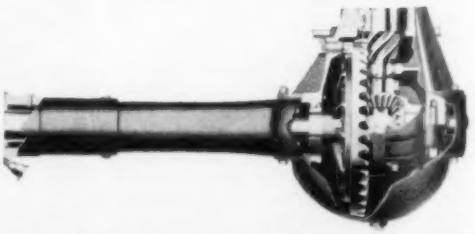
Wise truck owners keep a sharp eye on hauling costs. Their exact records tell which trucks cost less to run. That explains why big fleet operators and thousands of single-truck owners have been switching to Chevrolet trucks. They know that the Chevrolet six-cylinder Valve-in-head truck engine saves them money—on gas, oil and upkeep. They know that Chevrolet trucks give them smooth performance and plenty of reserve power without any needless extra cylinders. These and many other points of superior design have made Chevrolet America's *fastest selling truck*. Such overwhelming popularity is a reliable guide to follow. You can handle every job at a much lower cost by hauling with Chevrolets—the world's lowest-priced six-cylinder trucks!

CHEVROLET MOTOR COMPANY, DETROIT, MICHIGAN

Compare Chevrolet's low delivered prices and easy G.M.A.C. terms
A General Motors Value

173,000 MILES and still going strong!

This Chevrolet tractor-truck has covered 173,000 miles since Kniffen Brothers, of Fort Wayne, Ind., bought it in 1931. No repairs were necessary in the first 86,000 miles. The tractor has hauled "tough loads the year 'round" but still has the original clutch and brake linings.



HEAVY DUTY REAR AXLE. *Built for starting and pulling the heaviest loads. A straddle-mounted pinion, 4-pinion differential, oversize axle shafts, double-row wheel bearings, one-piece housing with big removable plate, give this axle extra strength and longer life.*

TRAFFIC CONTROL AND FACILITATION

Conducted by Publications Committee, Institute of Traffic Engineers, 175 Fifth Ave., New York

Maxwell Halsey, Chairman, Harry Hemmings, Reyburn Hoffman, Benoit Laberge, Theodore T. McCroskey, Donald M. McNeil, A. J. Naquin, Hawley S. Simpson, Arthur G. Straetz, Peter J. Stupka, Lawrence S. Tuttle, John C. Wrighton

Progressive Signal System for Michigan Avenue, Chicago

By W. C. BRANDES
Traffic Signal Engineer,
City of Chicago

AN accomplishment of outstanding importance in the field of traffic control is soon to be realized with the installation of the new flexible progressive system of traffic signals on Michigan Avenue in Chicago to replace the present simultaneous timing. The system will embody the latest ideas of progressive timing, which will be carried out by control mechanism of interesting design. Thirty-three intersections will be incorporated in the immediate system, which will cover a distance of 2.9 miles, between Roosevelt Road on the south and Burton Place on the north.

Michigan Avenue is Chicago's busiest artery and is limited to the use of passenger cars and busses. It carries more than 60,000 vehicles every 24 hours. In the heaviest hour the flow reaches beyond 2,600 units in one direction. The traffic has pronounced peaks in both morning and afternoon, with comparatively heavy usage during the evening hours and on Sundays and holidays.

A Comprehensive Plan

A thorough study of the street resulted in the laying down of a comprehensive plan which embodied minor physical changes, such as greater curb corner radii, lane markings, offset safety islands, and a progressive timing chart for the signals. Lengthy considerations terminated in the decision of the authorities to purchase and install signal equipment which would give the desired timing, leaving most of the physical alterations for a later date.

Detailed functional specifications were written which involved entirely new features of design. Several manufacturers, however, were prompt in resourcefully meeting all requirements. After painstaking consideration, the synchronous motor equipment manufactured by the General Electric Co., was chosen for the important task.

Some of the new features which the signal equipment provides are as follows:

1. Three-dial control for changing all timing to favor rush direction traffic.
2. Flashing green periods to indicate width of "through" band and to control speeds.
3. Timing on one side of the street, at many intersections, entirely independent of that on the other side.
4. Two time-lengths of the amber or caution period.
5. Walk indications for pedestrians.
6. Supervisory control at a central point with a spare supervisory unit at another point.

The three-dial feature allows three independent settings of all periods at each intersection, which will be used to provide maximum efficiency during the morning peak, the late afternoon peak, and average conditions. By this means the "through" band can be widened in the rush direction to a greater degree than if there were only one dial with a possible shift on the time scale of the starting point of the main-street "go" movement. "Through" band efficiencies can so be raised as much as 20 per cent, with relatively good progressive movement maintained in the non-rush direction. When shifting from one dial to that of another the slight hold, necessary at certain points, always will occur on the main-street green. That involved serious complications in control design, but the problem was solved satisfactorily by General Electric engineers.

New Flashing Green Signal

The flashing green feature is an entirely new idea developed initially for this installation. The purpose of having the green signal flash is to indicate to the operator of a vehicle the proper speed to travel. Any motorist upon seeing the green light flash at the next signal ahead will know immediately whether he is traveling too fast or too slow to be in proper position, and by adjusting his speed accordingly he will avoid any danger of being stopped by a red light. This will result in all traffic moving in a more compact grouping with a higher rate of flow.

The amber indication will overlap both the red and the green color, but the combination of red and amber preceding the "go" movement will be very short, approximately one-half as long as the green and amber period. It is thought this arrangement will have a decided lessening effect on the universal tendency to "jump" the amber.

On a street such as Michigan Avenue it is a distinct advantage to have separate indications for each direction of travel. There are many "T" intersections and at these points traffic on the blind side of the artery will have a red signal only a short time while pedestrians are allowed to cross that half of the street, and this period will not necessarily coincide with the period when vehicles are allowed to enter the boulevard from the side street. During the latter period left turns from the boulevard will move on a green arrow indication. Such treatment results in a better and more efficient form of progression.

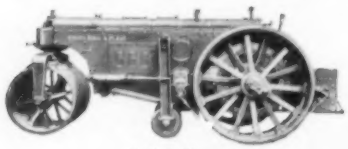
MICHIGAN AVENUE, CHICAGO
This view shows traffic stopped at each intersection under the old simultaneous timing of signals

The "Walk" Signal for Pedestrians

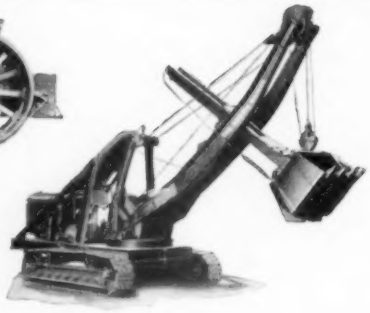
Pedestrians crossing either the main street or the cross street will have a "walk" indication ahead of them, when it is the proper time for them to cross. They do not have an exclusive period for movement, but are subject to normal interference. However, they are notified by the darkening of the "walk" lens at the instant after which a complete crossing to curb or island could not be undertaken. This measure was quite necessary at "T" intersections, since pedestrians cross only half the street at one time. They wait on the center island for a subsequent period to complete their crossing.

Supervisory control consists of two units at Randolph Street, one being in charge of the entire system, the other a spare which will cut in automatically upon failure of the main unit. Another

CONSOLIDATION ANNOUNCED

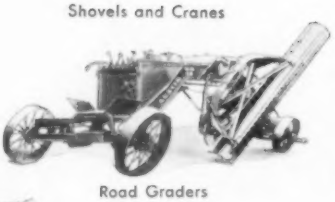


Roll-A-Plane

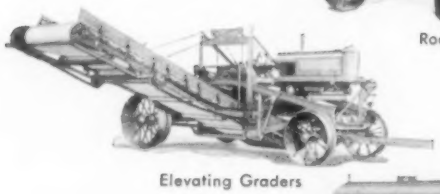


Shovels and Cranes

Wheelers, Scrapers and Plows

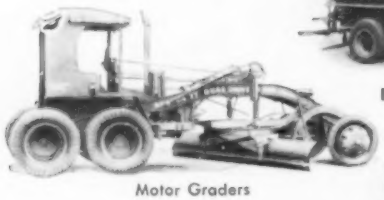


Road Graders



Elevating Graders

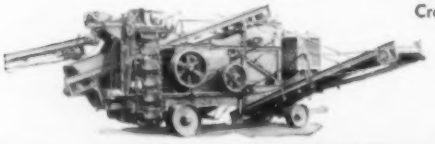
Bituminous Distributors



Motor Graders

Crushing and Washing Plants

Crawler Wagons



For Better Service, Manufacturing and Distribution, "Austin-Western" Forms One Centralized Organization.

● All members of the road building and contracting industries will observe with interest the formation of the Western-Austin Company. This new, yet familiar, name represents the unification of the Western Wheeled Scraper Company with the Austin Manufacturing Company. Duplications of departments, facilities and sales offices will be reduced.

● The Austin-Western Road Machinery Company has long handled the sales of the products of both companies and continues to do so under the new arrangement. Effective July 1st, the main offices of the Western-Austin Company and The Austin-Western Road Machinery Company will be located at Aurora, Illinois.

● This move, we feel, is not only for the benefit of the companies involved, but of the industries which they serve. The Austin-Western line has been recognized for many years as the most complete in the world. All of the machines have stood for high standards of design, construction and performance. The change announced herewith serves simply to strengthen the manufacturing set-up, simplify distribution and concentrate all service responsibility under one organization.

● Every engineer and contractor should be familiar with the entire Austin-Western line. Write for information on any of the machines pictured here, or the following:

	3-WHEELED AND TANDEM ROLLERS
STREET SWEEPERS	GRADING AND ROOTER PLOWS
SNOW PLOWS	WATER SPRINKLERS
BULLDOZERS	TRAILERS
MAINTAINERS	CULVERTS

The Austin-Western Road Machinery Co.
Home Office: Aurora, Ill. Cable Address AWCO, Aurora
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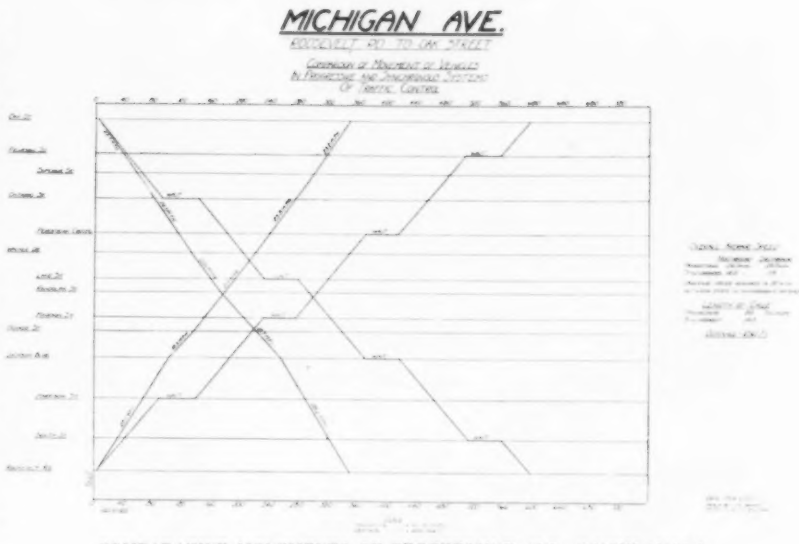
The Austin-Western ROAD MACHINERY CO.

ROAD ROLLERS, CRUSHING & SCREENING PLANTS, SCARIFIERS, SWEEPERS & SPRINKLERS, ROAD GRADERS, ELEVATING GRADERS. MOTOR GRADERS, PLOWS & SCRAPERS, BITUMINOUS DISTRIBUTORS DRAGS, SHOVELS & CRANES, DUMP WAGONS, SNOW PLOWS.

During July we hope you will remember to mention THE AMERICAN CITY

identical unit will be at a point just north of the Chicago River, floating constantly on the interconnecting line. The cable under the river is considered a likely source of trouble, and in case of failure there the third master control automatically will assume command of the north portion of the system, maintaining the same time-relation between the two sections. This master, in an emergency, can also regulate the entire system.

Average speeds on the thoroughfare will be doubled approximately with lower crest speeds than are now prevalent, thus materially increasing safety. Present non-rush hour speeds average 12 to 16 miles per hour, with considerably lower averages in the busy hours. The proposed timing will provide an average of 24 miles per hour. (See diagram showing comparative movements.) Higher over-all speeds mean that vehicles will be on the street a shorter space of time, thus making room for more units. In effect the capacity of the artery is appreciably increased.



COMPARATIVE MOVEMENTS OF PROGRESSIVE AND SYNCHRONOUS SYSTEMS

Safety Isles in Amsterdam, Holland

IN Amsterdam we do not use safety zones painted on the level of the road. We think they don't give enough protection to the pedestrian against automobiles. We use only elevated safety isles, not only for stops for street cars, but also as an aid for pedestrians to cross the roadway in safety. In the middle of the isle there is a lower part especially for use by invalids or by women pushing perambulators, as shown in the photograph.

In Amsterdam drivers are not always permitted to pass such safety isles at the left, viz., along the tracks of the street cars. This is shown to them by means of a white arrow on a blue field in the top of a beacon. This device is of aluminum, and during night hours it is lit inside, in order to make the arrow visible. The longitudinal hole in the base is filled in with white opalic glass.

To show that a safety isle may be passed both at the left and at the right we make use of the same model beacon but with green glass (instead of the white and the white and blue) showing no arrow at all.

Submitted by LEO A. A. COHEN,
Inspector of Police, Traffic Department, Amsterdam, Holland.

ELEVATED SAFETY ISLES IN AMSTERDAM, HOLLAND, WITH LOWER PART FOR USE IN CROSSING THE STREET
White arrow on beacon directs drivers to pass to the right

EDITORIAL NOTE.—In at least one American city, Milwaukee, Wis., the safety islands are built in like manner to permit perambulators to cross.

See "New Traffic Signs Adopted by Amsterdam, Holland," by Mr. Cohen, THE AMERICAN CITY, January, 1934, page 76.

Significant Paragraphs from "Public Safety," June, 1934

MOTOR vehicle deaths totaled approximately 31,000 in 1933, an increase of 5 per cent over the 1932 total.

Since 1922, automobile deaths of persons 15 to 24 years of age have gone up faster and farther than in any other age group.

Since 1927, practically all of the increase in motor vehicle deaths has come from collisions between motor vehicles, or between motor vehicles and fixed objects.

Motor Vehicle Deaths

JANUARY-MAY

1934	11,780
1933	9,860
1932	10,793
1931	12,025

(National Safety Council estimates)

Dupont Avenue, South, Minneapolis, Minnesota, Tarvia-built in 1921. Thirteen years can make a big difference in shrubs and trees, but it hasn't changed the smooth, easy-riding, skid-safe quality of the Tarvia pavement.

Barrett
Tarvia
GOOD ROADS AT LOW COST

Tarvia is made by The Barrett Company, America's oldest and most experienced manufacturer of coal-tar road-building materials. It provides a wide choice of suitable low-cost surfaces for new construction or for improving and widening existing roads. With any sort of Tarvia pavement—from improved secondary roads to express highways—repairs and maintenance are low in cost, because they can be made simply and quickly. Ask the Tarvia field man.

THE BARRETT COMPANY New York Chicago Birmingham Philadelphia St. Louis Minneapolis Hartford Detroit Cleveland Boston Buffalo Columbus Milwaukee Providence Syracuse Lebanon Toledo Cincinnati Baltimore Youngstown Bethlehem Rochester Portland, Me. THE BARRETT COMPANY, LTD., Montreal, Toronto, Winnipeg, Vancouver

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IMPROVING MUNICIPAL ADMINISTRATION

Current Items from the Public Administration Clearing House

Two New Municipal Leagues Formed

ARKANSAS and South Dakota cities have banded together to form two new state leagues of municipalities, according to announcement of the American Municipal Association.

Representatives of Arkansas cities met at Little Rock early in June, to organize the Arkansas Municipal League, electing as President Mayor U. E. Moore of North Little Rock. The League of South Dakota Municipalities was organized at Huron, S. Dak., on June 12. Mayor W. A. Rothschild, of Madison, S. Dak., is President of this association of cities, and Dr. G. R. Breckenridge, of the University of South Dakota, is the Secretary. Both of the new leagues will have the cooperation and the use of facilities of their respective state universities.

Addition of the Arkansas and South Dakota organizations brings the total number of state leagues of municipalities to 32, according to the American Municipal Association. Leagues already existed in Alabama, California, Colorado, Connecticut, Florida, Illinois, Indiana, Iowa, Kansas, Kentucky, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Louisiana, Nebraska, New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Texas, Viriginia, West Virginia and Wisconsin.

Fire Departments and the Depression

USING college students as apprentice firemen has been Fire Chief George B. Goff's way of saving money in his budget and improving the fire-fighting personnel of Oklahoma City during the depression.

Oklahoma City high schools and two universities supply the firemen, who serve their apprenticeship while going to school. At present there are 89 college men on the force and 83 of them indicate they would like to go into fire fighting as a profession.

The students apply their special college training to their fire department work. Chemists help make investigations of incendiary fires; law school graduates prepare and plead arson cases in court; public speakers give fire prevention talks over the radio; medical students attend injuries of department members.

Consolidation of fire companies, a common form of depression economy, is frequently a desirable move, writes Percy Bugbee, Assistant Director, National Fire Protection Association, in the June issue of *Public Management*, journal of the International City Managers' Association.

"In many cities," he says, "stations were planned on the basis of horse-drawn apparatus and not motor-driven apparatus. By careful planning and study, consolidation may now be effected without seriously reducing the efficiency."

In appraising the effect of the depression on fire departments, Mr. Bugbee lists as evils the elimination of fire prevention bureaus in many cities, though their cost represents at the most no more than 4 per cent of the total budget of the department; neglect of municipal fire-alarm systems, delay in the creation of paid fire departments to replace volunteers, and widespread disregard of the merit system in the appointment of fire chiefs.

Good effects, he says, have been the general recognition of the seriousness of the crime of arson, and an increase in fire department training and drill work.

Police-Records Analysis a Good Tool

KEEPING a good police-records system is an important function of police departments if they want to practice economy, Donald C. Stone, Director of Public Administration Service, told Kansas policemen in their annual school at Witchita recently.

"Installation of a well-rounded records system is a necessity, even in view of the present cry for saving money," Mr. Stone said. "A good records system makes possible the analysis of crime conditions and police hazards, so that officials may identify where the most trouble lies. This is useful in distributing and assigning members of the force, especially when it is at its minimum size, as is the case in many economy-minded cities today."

Police hazards refer to any characteristic of the city or its population which requires constant supervision or attention —high-valued property, poorly lighted streets, criminals or delinquents in bad housing areas, centers of racial conflicts.

"If police beats of equal size are established without recognition of the volume of time required in handling these hazards and duties, burdens will fall unequally upon the members of the department," Mr. Stone comments. "It is not a difficult matter to determine the average length of time it takes to investigate crimes or other matters or to perform such duties as trying windows, doors, inspecting hotel registers and looking in at dance halls. By studying these districts, it is possible to construct individual beats which divide duty equally among members of the force."

Many cities are using the consolidated daily and monthly report forms which the Committee on Uniform Crime Records of the International Association of Chiefs of Police has set up. These make it possible to answer such questions as: What crimes are being committed? How many of each kind? When and where are they done? What is the tendency with traffic accidents? How do arrests and successful prosecutions compare with those in preceding years?

Community Aid to Delinquents

COMMUNITY cooperation of all citizens and agencies interested in solving the problems of delinquent children is a recent development in several California cities, which have formed Coordinating Councils.

Police Chief August Vollmer of Berkeley, Calif., initiated the idea of making the whole community responsible for the delinquent. Los Angeles, which adopted the plan soon after, now has 48 of the Coordinating Councils, developed within two years.

Each Coordinating Council, which is divided into three committees, acts as a clearing house, to see that problems of individual children are referred to the proper agency for adjustment.

The committees are set up as follows:

1. *Adjustment.*—To bring to the local community officials from the county and city departments acquainted with the local problems; to make the service of these and other social workers available in working out a solution. Representatives of schools, police, and departments of welfare and health are among committee members.

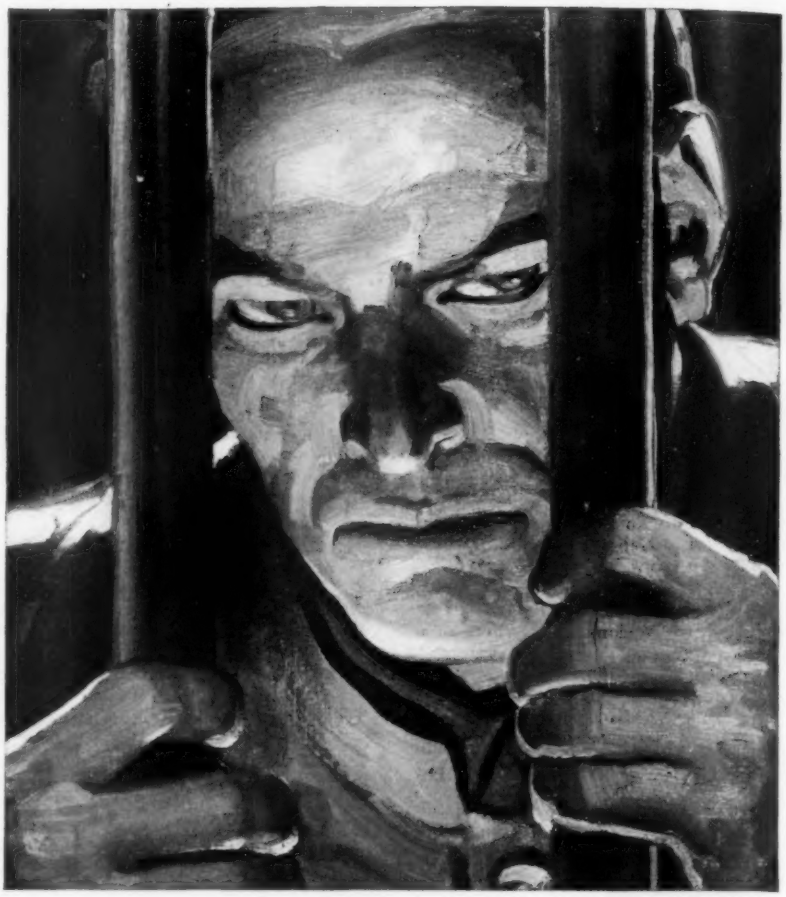
2. *Character-Building.*—To draw attention of character-building agencies to the individual children and to the areas most in need of their services. Representatives of churches, playgrounds, libraries, Boy Scouts, Camp Fire Girls and other similar organizations make up this committee. Providing proper recreational opportunities is one of its duties.

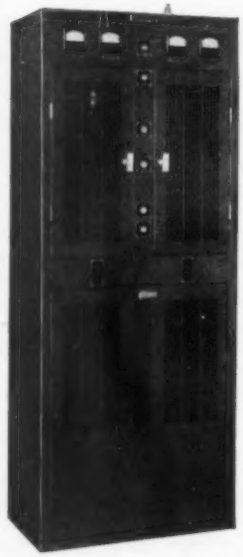
3. *Environment.*—To mobilize representatives of local civic service or organizations to improve the environment of delinquent children of the community. Parent-teacher associations, service clubs, women's clubs and the American Legion are represented on this committee. Among its duties are the study of local ordinances and state laws relating to children, with a view toward recommending action on their improvement where needed.

Although officials of the various Councils say they have no definite measure of improvement in the child delinquent situation in their communities, one Los Angeles high school reports that juvenile petitions decreased from 129 to 5 in one year through Council-police-school cooperation.

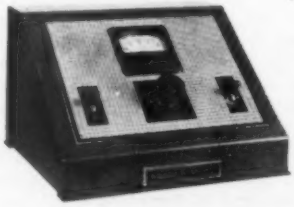
NEW 100 Watt Police Radio

helps to put him there!





Western Electric 15A Transmitter, with self-contained AC operated power supply, requires only 16" x 28" floor space. All vacuum tubes air cooled.



Western Electric 20A Control Unit —about the size of a portable typewriter—may be installed in room with transmitter or in remote location.

The Public Enemy works fast. But police in your city—aided by Western Electric radio telephone—can work even faster!

This *new* 100 Watt equipment is designed to meet Federal Radio Commission specifications for police use in cities of 100,000-200,000 population. It also may be operated economically at *less than 100 Watts* in smaller cities.

Outstanding features are: remote control—new type crystal with assured frequency stability—100% modulation by the grid bias method—operates instantly from "standby" position—includes facilities for "attention" tone—assures dependable performance at minimum cost for operation and maintenance—provides utmost protection for personnel. Monitoring permits operator to listen to station output as received by patrol cars.

For full details about Western Electric Police Radio transmitters—ranging in power from 50 to 500 Watts—write Graybar Electric, Graybar Building, New York, or telephone Graybar's nearest branch.

Western Electric

POLICE RADIO TELEPHONE EQUIPMENT

Distributed by **GRAYBAR** *Electric Company. In Canada: Northern Electric Co., Ltd.*

When you write for that catalog, kindly mention THE AMERICAN CITY

City Managers Becoming Professionalized

STRIDES in making the managing of cities a profession are seen from a survey of men now performing this service which appears in the book, "The City Manager Profession," by Clarence E. Ridley and Orin F. Nolting, published in June by the University of Chicago.

Three-fourths of the 629 city managers who have been in office during a part or all of the last three years had previously held governmental positions. Over half of these managers came directly from public positions. Nearly three-fourths of the 69 cities which made the manager plan effective during the years 1930-33 have appointed out-of-town men as their first managers. These are generally men with previous manager experience.

The typical city manager has attended college and has held one or more public positions before receiving his appointment as city manager at the age of 37. He has been in his present position four years and nine months. He is married and is now 47 years old. He is a member of the International City Managers' Association and holds membership in a local civic organization.

Rise of the profession of city manager is an expression on the part of the people that certain technical functions of local government must be administered by specially train technicians, the book points out.

"The majority of city managers by their everyday actions have indicated high standards of professional conduct. Further development of individual and group standards will make for a group of highly qualified men whose professional standing the public cannot possibly fail to recognize and appreciate."

Making the Most of the Land

WISCONSIN, first state to turn the tool of zoning to application in the county as well as the city, reports in a recent bulletin from the State University College of Agriculture that 20 counties have enacted zoning ordinances or are about to do so. Oneida County, initiator of the move a year ago, finds that one school district alone has saved nearly $300 this year on transporting pupils.

Consolidation of farming lands and setting-aside of forest districts are the two chief objectives of county zoning in Wisconsin. Most of the counties divide themselves into two or three use districts—forestry, recreation (resort business), and unrestricted.

Desire to curb expenses has given impetus to the interest in county zoning, since the causes of many of the costly items of government are found in the number of tax-delinquent farms. Public services—good roads, fire protection and schools—for isolated citizens are expensive. If people who make their living on farm or forest products cannot pay their taxes because they have chosen an unprofitable location, zoning the land according to its best use may help solve the problem.

Recent study of Washburn County, Wis., to show possible tax reductions through changes in local government, reveals that by zoning, school costs could be reduced at least $17,000 a year for the 105 pupils who come from farms. Highway maintenance could be cut $7,000 annually. If very small communities were consolidated as a result of abandoning unprofitable farms and other moving about, further savings would result.

People of a county are their own leaders in any movement toward zoning, in Wisconsin. The county board of supervisors or the county commissioners must sponsor a zoning ordinance first. After maps and data are collected, the public is invited to discuss the matter in informal town meetings and official county hearings. Town boards must approve the finished draft of the ordinance before it can be enacted. The board of supervisors administers the ordinance and can amend it only when town boards approve the changes.

Relief Workmen's Compensation

ONLY 18 of the more than 40 states compensating their public employees for injuries received on the job have interpreted their compensation acts to cover work relief employees, according to a survey just completed by the American Municipal Association and the American Public Welfare Association.

Seven of these states finance the protection by a state plan of insurance or self-insurance. Local units, either cities or counties, must finance the rest.

Twenty-six states offer only direct relief—food, clothing and medical care—for those injured on work-relief projects. State industrial commissions which interpret their compensation laws as covering work-relief employees are acting on humanitarian principles, the report comments, but the legal basis for this interpretation is still to be determined by the courts in several states.

During the period of CWA projects, the Federal Government took care of workmen's compensation. Now the responsibility has gone back to the states and to local units of government.

This means that: (1) the financial burden is in part thrust back upon localities whose sources of revenue have already run dry; (2) full compensation protection for injured work-relief employees is taken away in many states; (3) the single, uniform point of view and procedure in accident prevention work and in accounting and reporting are lost.

"Work-relief employees, subjected to hazards of work projects, should have the same measure of protection as regular workers in industry," the report concludes. "It is therefore desirable that both the compensation and relief statutes of the various states should be liberally interpreted, either through administrative ruling, court decision or specific amendment."

The best way of financing the compensation protection, the report points out, is to handle it as a state instead of a local matter. This broadens the base of the financial burden, so that it is more easily carried, and allows a uniform accident prevention program.

Where self-insurance is hazardous because of the small size of the city or county insuring, it is advised that special consideration be given the cost factor when the policy is taken out. If possible, excessive minimum rates for work-relief employees, as set up in insurance rates in many states, should be avoided.

Throwing Open the Books

BOND houses and investment bankers are demanding more facts than they used to about a city's financial condition before they purchase, bid on or recommend its municipal bonds. With some $15,000,000,000 of municipal bonds in the hands of investors and hundreds of millions more offered for sale each year, the free and easy credit of the 1920's is over.

This is an encouraging state of affairs, offering great potential advantage not only for investors but for the cities, says Frederick L. Bird, Director of Municipal Research for Dun & Bradstreet, writing in the current issue of *Municipal Finance*, official journal of the Municipal Finance Officers' Association.

Cities should seize this opportunity for building up satisfactory credit facilities by competent credit reporting, Mr. Bird points out. He cites as good proofs: one city which saved a full one per cent of interest on a large bond issue within two weeks by supplying facts which previously had been lacking; another which was able to dispose of previously unmarketable bonds by explaining the unusual resources of its public service enterprises; a third which found a favorable market by outlining the constructive policies of its new administration and demonstrating statistically the resulting financial improvement.

Investors are placing increasing stress on the quality of administration in determining a municipality's credit standing, Mr. Bird comments. Concise analysis of a city's financial condition issued at least twice a year is also a good check-up on conditions and trends for the officials themselves.

Data which investors want are set forth in a uniform questionnaire which the Municipal Finance Officers' Association and the Investment Bankers' Association of America have prepared for cities. This includes information on the municipality's debt, the current operating results, and the distinguishing features of local financial administration that add or detract from ability to meet obligations promptly.

Municipal finance officers, Mr. Bird says, are in a strategic position to place municipal credit on a permanently more stable basis by good financial reporting.

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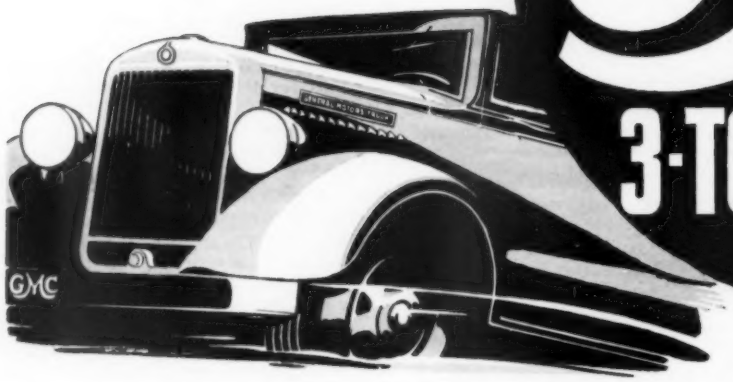
TRUCK NEWS!

A NEW GMC 3-TON TRUCK



An Outstanding Value

Any 3-ton truck priced at only $925 would ordinarily be considered a real value. But here is a 3-ton truck bearing the GMC name, a truck with every feature that insures truck-built performance, economy and dependability—and priced at only $925. Such a truck value is truly outstanding.

Listed at the right are a few of the many modern improvements found in this newest addition to the GMC line. They combine to produce not only a unit of unusual ability in its capacity range, but also a unit fully comparable with many so-called heavier duty trucks. *Write for details today.*

$925 CHASSIS F.O.B. PONTIAC

Gross Rating—12,500 Lbs.

Payload Capacity—2½-3½ Tons

Wheelbases—142"—166"—184"

GMC Valve-in-Head Engine
69 H.P. 155 Ft. Lbs. Torque

Frame 8" Deep

Centrifuse Brake Drums

Needle-Bearing Universal Joints

Maximum Tire Size
8.25 20 10-ply Duals

Full Floating Rear Axle

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What Next in Housing?

WITH the high hopes of many leaders in the real estate and construction industries, the so-called National Housing Act was adopted by Congress just before its adjournment last month. If the result is, as predicted, the spending of 2 billion dollars or more of private funds for the reconditioning and building of homes—and if such expenditures are restricted to areas where complete demolition or new neighborhood developments would not be the wiser course—much good may be accomplished.

There is little of encouragement in what has happened so far in the allocation and spending of the PWA funds which were expected so greatly to stimulate the clearance of slums and blighted areas and the construction of large-scale, low-rent housing projects. In a letter written to THE AMERICAN CITY on June 6, the Federal Emergency Administration of Public Works states that its total allotments to limited-dividend housing corporations aggregate $23,129,600, in addition to which the Public Works Emergency Housing Corporation has at its disposal $123,671,500, making a total of $146,801,100 available from PWA funds for the housing program. The actual disbursement up to that date, however, aggregated only $1,242,554, which includes $900,640 to limited-dividend corporations and $341,914 through the Public Works Emergency Housing Corporation.

Provisions of National Housing Act

From an analysis of the new National Housing Act, published in *Millar's Housing Letter* for June 25, the following paragraphs are quoted:

1. To stimulate home renovation work, insurance is authorized up to 20 per cent of the amount of loans made for this purpose by banks, trust companies, building and loan associations, installment lending companies, or other financial institutions. Individual loans are limited to $2,000, and it is provided that the total liability incurred shall not exceed $200,000,000.

2. After the modernization program is under way, emphasis will shift to new home building. Mortgages will be insured on new houses, or on existing houses, up to a limit on the amount of the mortgage of $16,000. The aggregate amount of mortgages on new houses (including low-cost housing projects) is not to exceed $1,000,000,000, and the same limitation applies to the insurance of existing mortgages. The interest rate on mortgages will be 5 per cent, unless the Administrator decides that conditions in certain areas make a higher rate advisable, in which case it will be 6 per cent. The mortgages may run up to 20 years and have a face value of as much as 80 per cent of the appraisal of the property. The premium to cover the cost of the insurance is fixed at from ½ to 1 per cent, in the discretion of the Administrator. Application for the insurance is to be made by the lending institution.

(a) An important provision in the final bill authorizes the extension of mortgage insurance to low-cost housing projects. These are classed as projects undertaken by Federal, state, or municipal instrumentalities, or by limited dividend corporations which are regulated or restricted by law, or by the Administrator as to rents, charges, capital structure, methods of operation, and rate of return. Insurance protection will not be extended to any project involving more than $10,000,000.

3. To attract private capital into home financing and divert surplus funds to communities which need them, the establishment of national mortgage associations capitalized at $5,000,000 each is authorized. These institutions will be authorized to issue obligations representing ten times their capital stock and to buy and sell insured mortgages. However, as stated already, they will not be permitted to make mortgage loans directly.

4. To aid home-financing institutions, whether or not they are members of the Home Loan Bank Board, deposit insurance will be offered by a new agency to be called the Federal Savings and Loan Insurance Corporation. This agency is to have a capital stock of $100,000,000 and is to be under the control of the Home Owners' Loan Corporation (the only part of the program not in charge of the Housing Administrator).

5. The bill permits national banks and other members of the Federal Reserve system to hold insured mortgages.

"Throughout the bill in the form that it has been enacted," concludes *Millar's Housing Letter*, "there is evidence of broad administrative power. This is one thing that the sponsors of the program were particularly insistent upon. They contended that if the hands of the Administrator should be tied, the full possibilities of the program could not be realized. At any rate, it is apparent that the Administrator will have ample power to control the situation. Up to a certain extent, he can encourage where he wants to and discourage operations that he thinks are socially or economically undesirable."

Three Federal Agencies Now Functioning

On June 30 James A. Moffett, of New York, was named Federal Housing Administrator under the above-mentioned act. Earlier in the month announcement had been made of the appointment of Col. Horatio B. Hackett, of Chicago, to succeed Robert D. Kohn as head of the housing division of the PWA. A third agency of the Federal Government which is functioning in the housing field is the Home Owners' Loan Corporation, of which John H. Fahey is President.

National Capital to Start Elimination of Alley Slums

ON June 12, President Roosevelt signed the District of Columbia Alley Dwelling Act, inaugurating a ten-year program for the progressive elimination of the National Capital's 200 inhabited alley slums. This action dramatically concluded 25 years' continuous effort to obtain effective legislation with which to cope with this 50-year old socio-economic problem, first given national recognition by President Theodore Roosevelt.

Upwards of 10,000 persons live in alley houses under conditions that foster crime, dependency and disease, so that the continued existence of these structures is a constant menace to public health, morals, safety and welfare. The principal purpose of the Act is therefore to eliminate these hidden communities and convert the inhabited alleys to uses that have economic or social value.

The Act provides not only for the purchase or condemnation of property in or adjacent to inhabited alleys and its replatting, but also for the construction of new housing, garages, or other buildings and their sale, lease, exchange, or management as may be necessary. The widest latitude of powers, properly safeguarded, is granted in order to permit of every practical solution. Loans may be made to limited dividend companies or home owners who wish to assist in the program.

A revolving fund of $500,000 is made available from allocations already made by the Public Works Administration for proposed slum clearance and low-cost housing projects in the District, thus eliminating the necessity for a new appropriation. In addition, funds may be borrowed from private sources.

To administer the Act, the President is to designate as "the Authority" an official or agency of the United States or the District of Columbia. It is understood that some of the Capital's civic leaders, as well as Federal and District officials, are being consulted as to the selection of the most effective agency, in view of the active and widespread support given the measure by welfare and citizen groups.

Legislation for elimination of the alley slums has been advocated for many years by the National Capital Park and Planning Commission, as being an essential part of the plan for Washington. Many of the Capital's blighted areas center around the inhabited alleys, and a marked decrease of population in these districts has been evident. The Alley Act will aid in their rehabilitation.

JOHN NOLEN, JR.,
Director of Planning, National Capital Park and Planning Commission.

Moving earth to build a race-track near Los Angeles. In two 12-yard trailers, the "Caterpillar" Diesel Seventy-Five moves 119 yards per hour on an 800-foot haul.

"I'm going to 'Caterpillar' Diesels altogether"

● ● SAYS C. G. FULLER, CONTRACTOR, OF BARNWELL, SOUTH CAROLINA, WHO ALREADY HAS THREE "CATERPILLAR" DIESELS AND FIGURES THEIR FUEL SAVING WILL PAY FOR THEM IN LESS THAN TWO YEARS.

On a road-building and creek-diversion job near Bloomington, Ill., the "Caterpillar" Diesel Seventy-Five pulls a "Caterpillar" Grader at a fuel cost of $1.96 per 10-hour shift.

AMERICA GOES DIESEL

In the foothills of the Sierra Nevadas, in California, this "Caterpillar" Diesel Fifty supplies material to a gold separator.

Every power user is doing a lot of figuring these days. Figuring gasoline costs—figuring the savings from a tractor that burns low-price Diesel fuel, and less of it—figuring the profit that he can earn from investing in "Caterpillar" Diesel power. Many have reached the conclusion that they can't afford not to adopt this modern equipment. Today there are nearly 3000 owners of "Caterpillar" Diesels—tractors and engines. Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

Prepared by
FRANK B. WILLIAMS
Author of "The Law of City Planning and Zoning"

ZONING and PLANNING NOTES

From Data collected by the Zoning Committee of New York (233 Broadway)

Streets

MARYLAND.—*Huebschmann v. Grand Co.*, 172 Atl. 227 (Court of Appeals, April 6, 1934.)—The Grand Co. is the owner of a theater which in the rear is on the line of an alley which is a public street. Several neighboring properties, including that of Huebschmann, use the alley as a rear entrance. The Grand Co. was granted a permit for an addition to its building extending 5 feet into the bed of the street. Huebschmann contests the validity of that permit.

The Grand Co. in its answer asserted that the extension of the theater did not interfere with the reasonable use of Huebschmann's property. The Court holds that the permit is invalid. The grant of the right to use a public street by the state removes the structure from the category of a public nuisance, but does not authorize the taking of private property without compensation; and the obstruction of a highway for a private purpose is totally unwarranted. Huebschmann, being an abutting owner, had a valuable right in the alley street. He is entitled to the use of the entire street. The fact that only part of it will be occupied by the theater, leaving him room to pass, is no defense. And, being specially damaged, he is entitled to sue.

EDITOR'S NOTE.—This case seems without question to state the law correctly. While so-called encroachments on public streets are often tolerated by the public authorities, it seems clear that a private owner especially damaged by them is ordinarily entitled to demand that they be removed.

See also the Alabama case of *McIntosh v. Moody* in our June, 1934, Notes; the California case of *Ex parte Anderson* in our June, 1933, Notes; the Illinois case of *People ex rel. Lapice v. Wolper* in our March, 1933, Notes; and the New York case of *Matter of Langley* in our August, 1931, Notes.

Zoning—Public Property

NEW YORK.—*Brocoris Realty Corporation v. Village of Scarsdale*, 269 N. Y. S. 746 (Supreme Court, Appellate Division, March 5, 1934).—The village had no right to violate its ordinance by the erection of a general municipal garage.

EDITOR'S NOTE.—This case follows the New York case of *O'Brien v. Town of Greenburgh*, discussed at some length in these Notes for February, 1933.

Eminent Domain

OKLAHOMA.—*Ramsey v. Leeper*, 31 Pac. 2d, 852 (Supreme Court, December 12, 1933).—A tract of land was appropriated by Oklahoma City through condemnation proceedings for a water-works system for the city. The judgment in the proceedings recited that full value had been paid for the land and that title in "fee simple" was conferred upon the city. It later developed that the exclusive use of the entire tract of land thus condemned was unnecessary for the purpose for which it was condemned, and the city transferred a portion of the land to W. R. Ramsey with restrictions to prevent or minimize the pollution of the reservoir located, nearby, on the part of the tract retained by the city. Leeper, in this proceeding, is suing for the land which the city conveyed to Ramsey, claiming that the city did not obtain such a title to this part of the tract as would enable him to transfer it to Ramsey, a private individual. Leeper asserts that the city acquired only an easement to use the land for the purposes for which it was condemned; that the attempted sale of the part of the tract transferred to Leeper by the city was an abandonment of that use as to that part, and possession of it therefore reverts to Leeper, the representative of the original owner of the land, who continued to own the fee to the entire tract, subject to the easement.

The Court holds that there are no provisions in the constitution of the state of Oklahoma to prevent the Legislature from enacting laws enabling the city to acquire a fee simple; that such a law was enacted, and under it the city obtained a fee simple to the entire tract, and could therefore transfer a part of the tract in fee simple as it did do.

EDITOR'S NOTE.—This transaction superficially resembles an excess condemnation in which a public body takes more land than is needed for a given improvement and may sell the excess with or without appropriate conditions. In fact, however, the city asserts that it acquired the entire tract for the reservoir and appurtenances, and its word is not challenged. When it subsequently discovered that it did not need the entire use and title to a part of this tract, it is clear that the city had a right to sell what it did not need, provided it had obtained a full or fee simple title, which, the Court holds, it did do. Thus the results of excess condemnation were obtained, but by ordinary condemnation proceedings.

Formerly it was the usual practice of public authorities desiring new thoroughfares or parks to acquire only an easement for the desired purpose; nowadays, more and more, these authorities are taking a fee. The reason is obvious. The fee costs little if anything more than the easement, and the added rights of the fee title are often useful; indeed, often must be acquired later at added expense. See in this connection the California case of *Spinks v. City of Los Angeles*, as reported in our June, 1934, Notes.

Board of Appeals—Appeal

PENNSYLVANIA.—*Appeal of Board of Adjustment, Lansdowne Borough*, 170 Atl. 867 (Supreme Court, January 30, 1934).—This is an appeal by the Board of Appeals from a final order of the Court below reversing a decision of that Board. The statute gives the Court of Common Pleas the power to allow an appeal to review the decision of the Board. That statute does not give any right of appeal from the decision of that Court. Whether or not, despite that fact, a property owner injuriously affected may take such an appeal, or the borough may do so as the representative of all the property owners, the Court does not decide, since no such appeal has been taken.

The Court does hold, however, that the Board of Appeals has no right to such an appeal, since it has not been, and cannot be, injuriously affected by the order. It might as well be claimed that a Court Auditor or Master could appeal from a decree of the Court sustaining exceptions to his report. The appeal of the Board of Appeals from the decision of the Court of Common Pleas is therefore quashed.

Recent City Manager Appointments

E. P. CLARK has been appointed City Manager of Ocala, Fla., to succeed J. C. Jones.

O. K. Atwood succeeds George Garrett as City Manager of Astoria, Ore., and also retains his former position as City Auditor.

Arnold M. Hoppersted has been appointed City Manager of Alpena, Mich., to succeed George R. Nicholson.

Edward C. Peterson became City Manager of Washburn, Maine, on June 1. He succeeded W. E. Brackett.

G. H. Pelvosek has been appointed City Manager of Beaumont, Texas, to succeed Paul H Millard.

O. S. Roen, City Manager of South Pasadena, Calif., has been appointed City Manager of Alhambra, Calif., to succeed L. D. White.

Frank W. Voisine succeeds Harry Eriksen as City Manager of Manistique, Mich.

Charles Wells, former City Engineer, has been appointed City Manager of Albuquerque, N. Mex., to succeed James N. Gladding.

CLARENCE E. RIDLEY,
Executive Director, The International City Managers' Association, Chicago.

The Municipal Bond Market

Typical sales of new issues, from June numbers of *The Bond Buyer:*

Amount	Borrower and Purpose	Rate (%)	Term (Years)	Basis (%)
$200,000	West Hartford, Conn., Funding	1.75	1-4 Ser.	1.71
190,000	Binghamton, N. Y., Bridge Improvements, 1934	1.75	2 5/6 Avg.	1.74
225,000	West Hartford, Conn., Sewer Construction	2.75	10 2/3 Avg.	2.72
		2.90	1-20 Ser.	2.86
200,000	Utica, N. Y., Public Works	4.00	16 2/3 Avg.	3.43
1,312,500	Lexington, Ky., Public Works			
302,000	Putnam Co., N. Y., Highway Improvement	3.50	16 1/3 Avg.	3.48
		4.00	10 Avg.	4.00
115,000	Belleville Twp., Ill., High School	4.20	8	4.19
200,000	Jacksonville, Fla., Refunding	4.25	20¼ Avg.	4.22
268,000	Paterson, N. J., Water System, 1934			
175,000	Des Moines, Iowa, Armory and World War Memorial Building	4.25	12 1/3 Avg.	4.24
700,000	Portland, Ore., Improvement	5.00	3-10 Opt.	4.99

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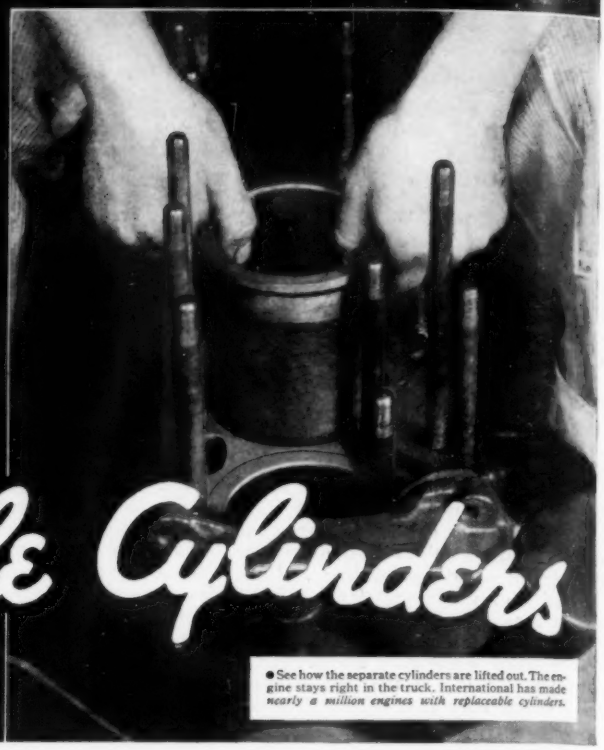
Replaceable Cylinders



● See how the separate cylinders are lifted out. The engine stays right in the truck. International has made *nearly a million engines with replaceable cylinders.*

IN ALL heavy-duty 6-cylinder International Trucks from 1½-ton to 7½-ton the *cylinders are individually removable and replaceable.* When the old cylinders are worn, brand-new cylinders and pistons, duplicates of the originals, are put in. The vital part of the engine is actually made as good as new. *Reboring does not renew*—each reboring changes and unbalances the engine and weakens the cylinder walls. Reboring *destroys* original coordination of parts; replacement *restores* it. Replacement—of one, or two, or all cylinders—can be speedily, easily, and economically made in an International while the engine stays in the truck. Moreover—replaceable cylinders make an International engine a better engine from the start. Its cylinder walls are machined to uniform thickness, assuring even cooling, even expansion and contraction.

We *know* the lasting value in this feature. In the past twenty years International Harvester has placed in users' hands *nearly a million engines with cylinders removable.* That means a world of experience, a world of opportunity for *knowing.*

Replaceable cylinders are an excellent example of the *extra* quality and value built into International Trucks. They add to the cost of manufacture, but *they lower the cost of hauling.* Veteran International owners whose trucks take everlasting punishment know this feature for "a swell idea." They say that it "adds $500 to the value of a truck"—"adds tremendous mileage to its life." Ask some of them!

When you need trucks, have an International demonstrated to you—the right model for the job. Sizes range from ½-ton to 7½-ton. Telephone a nearby International branch or dealer.

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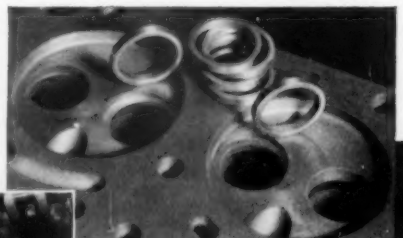


● **Above:** *Hardened Exhaust-Valve Seat Inserts.* This feature was long ago made standard International practice. These inserts retard valve seat burning, engine efficiency is retained, and the valves seldom need grinding.

● **Left:** *Replaceable Precision-Type Bearings,* another feature of International Truck engines. These bearings make it possible to replace connecting-rod or main bearings quickly, at low cost. This man is under the engine, replacing the bearings. The engine stays right in the truck.

When you visit THE WORLD'S FAIR at CHICAGO, don't fail to see the beautiful display of restyled Internationals in the Harvester Exhibit.

INTERNATIONAL TRUCKS

THE CITY'S LEGAL RIGHTS AND DUTIES

Conducted by A. L. H. STREET, Attorney at Law

Accidents

Abutter constructing sidewalk with glass prism inserts held obligated to maintain sidewalk in good repair (New York Supreme Court, Appellate Division: *Niehaus v. Caryfield, Inc.*, 269 N. Y. Supp. 335).

Condemnation Proceedings

City held not guilty of such bad faith as to render it liable for special damages due to delay in either abandoning condemnation proceedings or paying award (Maryland Court of Appeals: *Petroli v. Mayor and City Council of Baltimore*, 171 Atl. 45).

Contracts

Sewer construction contract held not to imply warranty by municipality that rock to be excavated would be of usual character (United States Circuit Court of Appeals, First Circuit: *H. W. Golden & Son v. Inhabitants of Town of Marblehead*, 68 Fed. 2d, 875).

Nepotism

Mayor ousted for violating constitutional provision by appointing cousins to municipal positions (Missouri Supreme Court: *State v. Ferguson*, 65 S. W. 2d, 97).

Official Bonds

Surety on tax collector's bond held not free from liability because of informalities in appointing collector and approving bond (Kentucky Court of Appeals: *Fidelity & Deposit Co. v. Commonwealth*, 67 S. W. 2d, 719).

Ordinances

Until contrary is shown, an ordinance is presumed to have been regularly adopted (South Carolina Supreme Court: *Town of Brookland v. Broad River Power Co.*, 173 S. E. 71).

Peace Measures

Ordinance penalizing display of flag, etc., of nation, organization, etc., apt to provoke riot, etc., void for indefiniteness (California District Court of Appeal: *People v. Young*, 29 Pac. 2d, 440).

Poor Relief

Farm tenant owning considerable mortgaged personal property held not a "poor person" for whose hospital expense township was liable (Minnesota Supreme Court: *Evangelischer Diakonissen Verein v. Town of Cannon City*, 253 N. W. 97).

Public Health

City held liable for pay of chemist temporarily employed at sewage plant under order of State Board of Health (Ohio Court of Appeals: *Hess v. City of Canton*, 189 N. E. 18).

Police power to protect public health held not broad enough to enable city to compel private water company to furnish water without compensation for flushing toilets on private premises to which service had been discontinued (Pennsylvania Supreme Court: *Tri-Cities Water Co. v. City of Monessen*, 169 Atl. 159).

Public Utilities

Telephone company held not liable for gross earnings tax nor subject to ouster by city after expiration of original franchise (United States District Court, Northern District of Oklahoma: *City of Tulsa v. Southwestern Bell Telephone Co.*, 5 Fed. Supp. 822).

Purchases

Charter provision for competition in purchases as "may" be established by ordinance held permissive and not mandatory (Florida Supreme Court: *Brown v. City of St. Petersburg*, 153 So. 140).

Statutory prohibition against purchase of supplies from firm in which member of municipal board is interested held inapplicable to purchase of bonds; right to complain of purchase held barred by delay (Florida Supreme Court: *City of Leesburg v. Ware*, 153 So. 87).

Radio

License tax on radio stations upheld (Georgia Supreme Court: *City of Atlanta v. Oglethorpe University*, 173 S. E. 110).

Safety Measures

Ordinance requiring $200,000 bond to indemnify against damage, as condition to permit to drill oil well within city limits, upheld (Oklahoma Supreme Court: *C. C. Julian Oil & Royalties Co. v. City of Oklahoma City*, 29 Pac. 2d, 952).

Salaries

Wrongfully dismissed City Assessor held entitled to salary (North Dakota Supreme Court: *Ness v. City of Fargo*, 251 N. W. 843).

Soldiers' Preference

City Council held not to have abused discretion in refusing to appoint a soldier veteran as street commissioner; his qualifications being in doubt (Minnesota Supreme Court: *State v. Barker*, 251 N. W. 673).

Special Assessments

Assessment of remainder of abutting lot for local improvement held not defeated by conveying 10-foot strip along street (Kentucky Court of Appeals: *Bosshammer v. Town of South Ft. Mitchell*, 68 S. W. 2d, 413).

Streets

Home-rule city charter held not to permit elimination of railroad grade crossings at municipal expense (Texas Court of Civil Appeals: *City of Beaumont v. Priddie*, 65 S. W. 2d, 434).

City held not liable to lessor of building because tenant vacated premises when sewer contractor placed equipment in front of it (Michigan Supreme Court: *McGavock v. Healy*, 251 N. W. 315).

City held entitled to enjoin maintenance of gasoline curb pumps (Iowa Supreme Court: *Incorporated Town of Lamoni v. Smith*, 251 N. W. 706).

Citizen held not entitled to compel town to require removal of curb gasoline pumps (New Mexico Supreme Court: *Dunn v. Town of Gallup*, 29 Pac. 2d, 1053).

Filling-station operator held not entitled to compel city to furnish street connecting his premises with highway (Texas Court of Civil Appeals: *City of Gainesville v. Amarose*, 67 S. W. 2d, 1054).

Suit Immunity

As an agency of the state, a municipality is not subject to suit except as permitted by statute (United States District Court, Southern District of Mississippi: *Stevens v. Brookhaven Municipal Separate School District*, 5 Fed. Supp. 629).

Sunday Restrictions

Agreement to turn net proceeds of movie theater over to emergency relief committee held not to legalize Sunday operation (Georgia Supreme Court: *Thompson v. City of Atlanta*, 172 S. E. 915).

Taxicabs

Ordinance regulating taxicab operation upheld (Texas Court of Civil Appeals: *Dallas Taxicab Co. v. City of Dallas*, 68 S. W. 2d, 359).

Statutory power to regulate taxicabs held not to authorize fixing of fares (Oklahoma Supreme Court: *Y. & Y. Cab Service v. City of Oklahoma*, 28 Pac. 2d, 551).

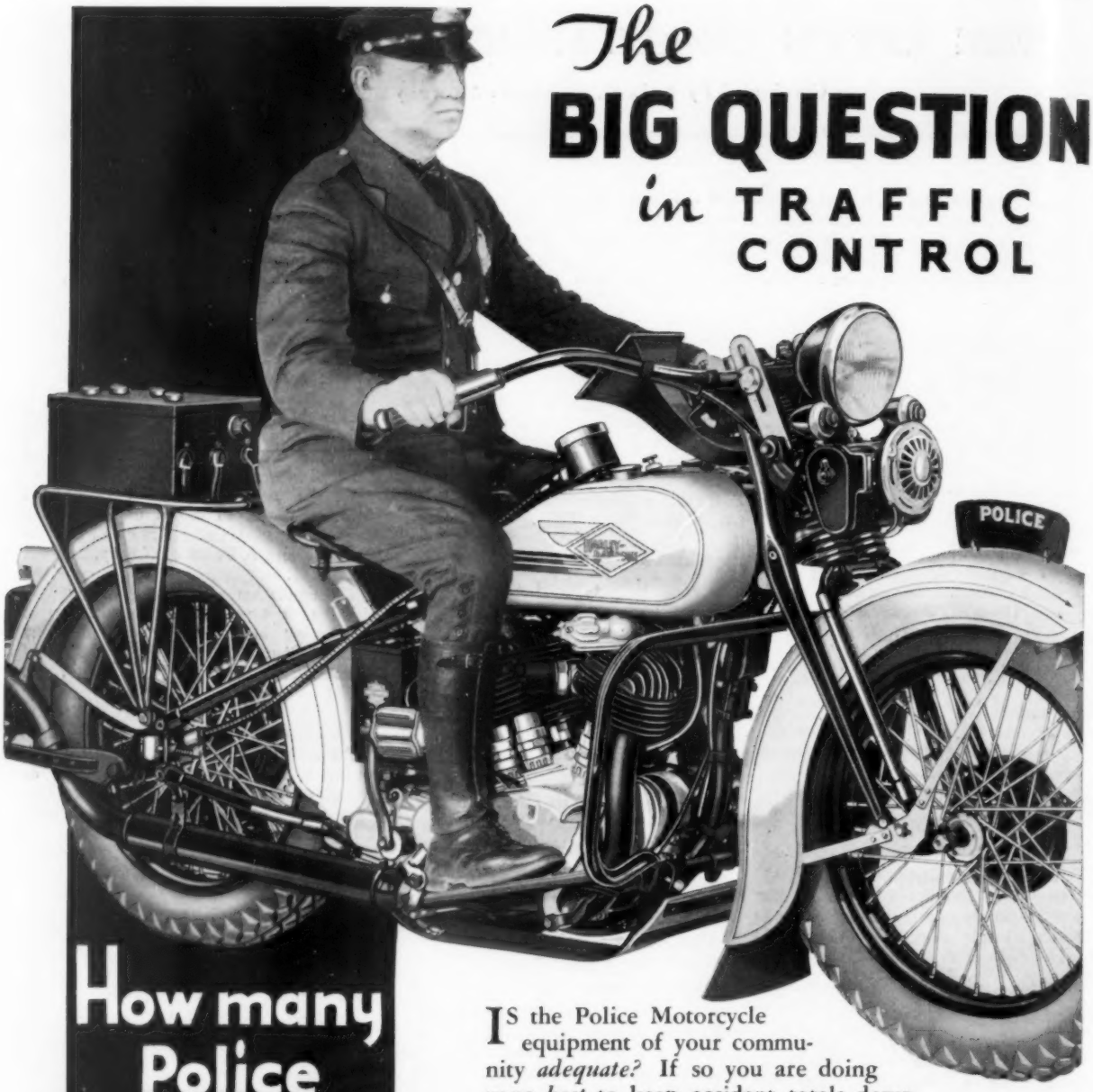
Traffic Regulations

Fire chief driving automobile held to have right-of-way although outside city limits, but nevertheless bound to use due care to avoid accident (Maine Supreme Judicial Court: *McCarthy v. Mason*, 171 Atl. 256).

Workmen's Compensation

Where city had no ordinance creating office of policeman, appointees held "employees," and as such covered by workmen's compensation act (Illinois Supreme Court: *Murphy v. Industrial Commission*, 189 N. E. 302).

The BIG QUESTION in TRAFFIC CONTROL



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IS the Police Motorcycle equipment of your community *adequate?* If so you are doing your *best* to keep accident totals down.

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Planning

Radburn: A Plan of Living—By Robert B. Hudson, Assistant to the Manager for Community Activities, under the supervision of John O. Walker, Manager of the Radburn Association.—Published by the American Association for Adult Education, 60 East 42d Street, New York. VI + 118 pp. Charts. $1.00 *to members of the Association;* $1.25 *to non-members.*

In the borough of Fair Lawn, Bergen County N. J., is Radburn, a community with a physical plan, an administrative plan, and a citizens' plan; designed to provide suitable homes for people of moderate incomes and the safe and convenient use of motor vehicles, to secure health, recreation and education for its residents, and to foster organized and effective cooperation in many activities that make for happiness. This volume explains the ways in which the various elements of this comprehensive plan are working out, giving concrete evidence of the growth and adjustment of its program, and particularly describing the unique organization of community activities, with detailed accounts of the participation of the residents in the interests of the various groups.

Appraisals

Appraising Residential Property—Methods, Cost Data and Instructions.—By Cuthbert E. Reeves, 1934. Published by the author, Liberty Bank Bldg., Buffalo, N. Y. 1934. 100 *pp.*

The author has compiled this book primarily for the purpose of assisting the numerous appraisers now functioning under the Home Owners' Loan Corporation, such as insurance companies, banks, building and loan associations, title and mortgage corporations, and governmental agencies. While concise and simple, it has been planned to be instructive and helpful to many who are experienced and skilled as assessors.

Housing

A comprehensive study of housing conditions in Dayton, Ohio, and their relationship to moral influences and sociological cases as shown in dollars and cents, was conducted in 1933 as a CWA project by the City Plan Board of that city. Many public and private agencies interested in the construction, health, and sociological problems involved cooperated in the work. The report is submitted by Harold E. Winey, Secretary-Engineer of the Board. 95 photo offset reproduction pp.; maps, graphs, tables. (Apply to the City Plan Board, Dayton, Ohio.)

A three-year report on "Housing in Pittsburgh"—1931-1933—is presented by the Pittsburgh Housing Association, whose policy is to encourage and promote, not to undertake, a program of reconstruction of slum or decadent areas; provision of low-cost housing; and vigorous enforcement of housing and sanitary laws. The progress of its work, through great difficulties in the face of appalling conditions, is given frankly. Its program "is now on the way to becoming orthodox." There are always inadequacies and obstacles, but with the creation of the Federal Public Works Emergency Housing Corporation, whose purpose is to reconstruct slum areas anywhere in the country, the Housing Association has taken the initiative in securing for Pittsburgh a coordinating committee to weld into an effective program the various projects being submitted to Washington. 32 pp. Illustrated. (Apply to the Association, Pittsburgh, Pa.)

The Housing Study Guild (101 Park Ave., New York) has issued No. 1 of its Housing Study Bulletin—a technical review of the work of the Guild. This number contains a check list of "Critical Items in Examining Plans for Low Cost Urban Housing," and an "Analytical Study of Recent Housing and Planning Studies in New York City," each of these by a committee of the Guild. Library Notes are also included. June, 1934. 20c a copy; subscription for the next 6 issues, $1.00. (Apply to the Guild.)

Civics

Civic Education in the United States (Report of the Commission on the Social Studies in the Schools—Part VI).—By Charles E. Merriam, Professor of Political Science, University of Chicago. Charles Scribner's Sons, New York. 1934. *XXII + 196 pp.* $1.75 *from* THE AMERICAN CITY.

Professor Merriam does not attempt to lay out a detailed program of civic education in the schools, but rather to show the needed trend, scope and spirit of such a system. Civic training must be re-oriented in terms of modern social and economic realities, for changes are here and will continue to come. The basic factors in social and governmental life should be brought together in the integration of civic with social studies, and with all the other studies of the school. A particularly interesting chapter in this volume is the one on the special agencies which contribute to civic education in the United States. It is emphasized that attention should be paid to the progressive changes in the structure of government and the factors which affect political organization and functioning; and also to the techniques of political control. Especially important is it that students should be aware of the facts of the actual operation of practical politics, while still recognizing the possibilities of excellence in administration, leadership and justice. An understanding of the actual civic needs of the pupil must be met by the civic equipment of the teacher in the shaping of ideals and purposes.

Government

The Public Administration Service (850 E. 58th St., Chicago, Ill.) has issued an 8-page pocket-size folder entitled "Your Business of Government," giving brief lists of publications issued as follows: by the Public Administration Service, "Helps in Solving Many Varied Governmental Problems, Prepared for Your Use by People Who Know Your Problems" (29 titles); by the American Municipal Association, "Mimeographed Summaries of the Ways Cities Treat Specific Problems" (20 titles); by the American Legislators Association, "Data on Current State Problems" (10 titles); by the International City Managers' Association, "Progressive City and County Administration" (5 titles); by the Municipal Finance Officers' Association, "Public Funds and How to Handle Them" (5 titles). A check list is included, and any of the publications may be ordered from the Public Administration Service. (Apply to the Service for the folder.)

"Unemployment and Relief Documents" is the title of a bibliography of source materials compiled by the Document Section of the University of Chicago Libraries, as Publication No. 39, published for the American Public Welfare Association by the Public Administration Service (850 E. 58th St., Chicago, Ill.) It consists primarily of official governmental publications and special research reports, not copyrighted and not issued by trade publishers, beginning with 1929 and covering the period up to April 1, 1934. 18 pp. (Apply to the Public Administration Service.)

Traffic

An "Engineering Manual for Traffic Surveys," covering the method of organizing and conducting each of several important studies of a traffic survey, including field and office forms and detailed instructions for their use, has been issued in mimeographed form, by the Federal Emergency Relief Administration. March, 1934. It was prepared under the direction of Sidney J. Williams, Director of Safety and Traffic Surveys, and Peter J. Stupka, Assistant Director of Traffic Surveys, Federal Civil Works Administration, by Burton W. Marsh, Director, Safety and Traffic Engineering, American Automobile Association; Earl J. Reeder, Traffic Engineer, National Safety Council; and Maxwell N. Halsey, National Bureau of Casualty and Surety Underwriters; in collaboration with Lewis V. Bullis, Roland Woodward, Jr., Oscar Gunderson, and William E. Brown. Charts, graphs, tables. About 150 sheets. (Apply to Federal Emergency Relief Administration, 1734 New York Ave., N. W., Washington, D. C.)

Taxation

The City Real Estate Tax in Pittsburgh.—By J. P. Watson. Bureau of Business Research, University of Pittsburgh, Pittsburgh, Pa. 1934. 108 *pp.* $1.00.

A study of the role of the real estate tax in Pittsburgh, with respect to increase of governmental costs, tax delinquency and other factors. Inasmuch as Pittsburgh has pioneered in the adoption of a graded tax plan whereby land is taxed at twice the rate on buildings, it is disappointing that the author did not devote more space to a consideration of this feature. A critical analysis by competent persons of the operation of the graded tax plan in Pittsburgh would be of great interest and value in other cities. It is indicated that building values have increased much more rapidly than land values, but there is no attempt to compare the increase in building trend in Pittsburgh with that of other cities. It is the conclusion of the author that the tax differential on land has been largely wiped out through recapitalization of land values.

MABEL L. WALKER.

Recreation

Recreation for Girls and Women.—Prepared for the National Recreation Association by Ethel Bowers, the Katherine F. Barker Memorial Field Secretary in Athletics and Recreation for Women and Girls. Published by A. S. Barnes and Company, New York. 1934. *XXIII + 425 pp. Diagrams.* $3.00 *from* THE AMERICAN CITY.

Organized recreation for girls and women is presented in this full manual of activities and methods. An outline of the changes and the problems that the years have brought in leisure activities and of the physical, creative, social, mental and service values that a balanced program should secure, is followed by the concrete presentation of activities for five different age groups and types, with detailed instructions for every part of the program. Methods of organization and administration are given in Part II. The chapter on Leadership is an especially inspiring part of this very valuable book.

City Manager Plan

The City-Manager Profession.—By Clarence E. Ridley and Orin F. Nolting, Director and Assistant Director, The International City Managers' Association. Foreword by Louis Brownlow. The University of Chicago Press, Chicago, Ill. 1934. *XV + 143 pp.* $2.00 *from* THE AMERICAN CITY.

For comment on this book, see page 77 of this issue of THE AMERICAN CITY: "City Managers Becoming Professionalized."

Sewage Treatment

The American Public Health Association has published in a pamphlet of 54 pages a report of the Committee on Sewage Disposal of the Public Health Engineering Section of the Association, on "Chlorination in Sewage Treatment." It presents principles and facts relating to the use of chlorine in sewage treatment, of interest to laymen, doctors, and engineers. The many articles written on this subject during more than 30 years have furnished much interesting material, and the Committee has analyzed conflicting points of view and indicated rational lines of thought. Tables, graphs. (Apply to the American Public Health Association, 50 W. 50th St., New York.)

Libraries

A Manual of Practice entitled "Public Administration Libraries" has been prepared by a committee of the Civic-Social Group of the Special Libraries Association, and is published by the Public Administration Service, 850 E. 58th St., Chicago, Ill., as Publication No. 40 of the Service. Its contents include: Types of Libraries; Acquisition of Material; Classification and Cataloging; Standards of Service; Budgeting and Personnel; Physical Care of the Collection; Special Collections as Aids to Research. $1.00. (Apply to Public Administration Service at the address above.)

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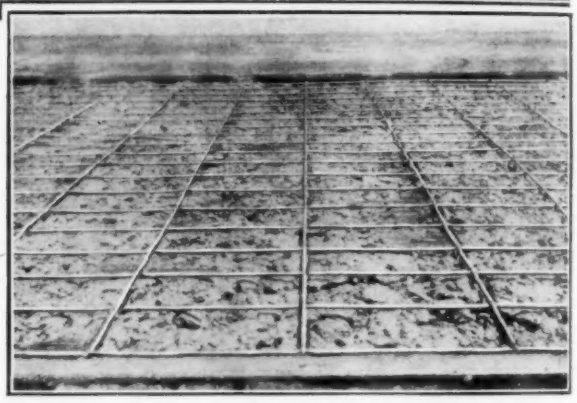

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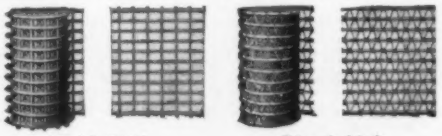

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Highways

From the Proceedings of the 1933 annual meeting of the Highway Research Board two papers have been preprinted, in pamphlet form: from Report of Project Committee on Tractive Resistance, "Skidding Characteristics of Road Surfaces," by R. A. Moyer, Associate Professor of Highway Engineering, Iowa State College; and "Coefficient of Friction Between Tires and Road Surfaces," by Karl W. Stinson, Associate Professor of Automotive Engineering, and Charles P. Roberts, Assistant Professor of Mechanical Engineering, Ohio State University. 69 pp. Views, drawings, graphs. (Apply to Highway Research Board, National Research Council, B and 21st Sts., Washington, D. C.)

Information Series, Number 20, of The Asphalt Institute contains digests of three recent outstanding highway papers: "Report on Cost of Roads," by Charles B. Breed, Consulting Engineer, Massachusetts Institute of Technology; "Maintenance Costs over a Period of Years," from *Public Works Magazine;* and "Cost of Vehicle Operation," by H. E. Phelps, Professor of Highway Engineering, State College of Washington. 12 pp. (Apply to The Asphalt Institute, 801 Second Ave., New York.)

Unemployment Relief

An exceedingly interesting and valuable account of "Work Relief in Germany" has been written by Hertha Kraus, Ph.D., for the Charity Organization Department of the Russell Sage Foundation. Dr. Kraus, a graduate of the Training School for Social Workers at the University of Frankfurt, was for four years Field Director for the Child Health program conducted in Germany by the American Friends' Service Committee, and later Director of the Department of Public Welfare of the city of Cologne. The scope of the study is indicated by the outline of contents—and its vigor, its intelligent presentation of the sweep and detail of organization, its sympathetic description of the planning and carrying-out of projects for preserving the working capacity of men and women, are to be appreciated and enjoyed by the careful reader. 93 pp. Illustrated. 50c. (Apply to the Russell Sage Foundation, 130 E. 22d St., New York.)

Taxation

The Bureau of the Census, U. S. Department of Commerce, is preparing tabulations of "General Property Levies, Collection and Delinquency," by states and counties, compiled on levies for the fiscal year ending June 30, 1933, several mimeographed preliminary releases of which have been made. The tabulations are by counties within states, and in this form are not fully comparable between such counties, or between states, because of variations in basic data. They are a by-product of a larger and more comprehensive study of trends in tax delinquency from 1928 to date, the results of which will be strictly comparable because of the methods employed in collecting and tabulating the data. (Apply to the Bureau of the Census, Washington, D. C.)

Housing

"Report on Civil Works Administration Project No. 3512," submitted by The City Planning Board of Boston, Mass., was issued March 31, 1934, in an imposing volume of 296 photo offset reproduction pages, with views, plans and maps. It is in three parts: Housing Studies; Engineering Studies; and Landscape Studies. It is the work of 16 professional men, with supervisors, draftsmen, field workers and clerical staff—461 in all. Basic data maps for the entire city were made, showing assessed valuation of property, tax-exempt property, industrial property, vacant land and buildings, class of construction, number of families per acre, density of buildings, and density of population. See page 55 of this issue for some of the conclusions of the professional group. William Stanley Parker, Vice-Chairman of the City Planning Board and Chairman of the Advisory Committee on Housing, initiated the work and developed the program, and was its inspiration throughout. His statement of the fundamental policies formed the basis for all the housing studies, but he made no effort to control the conclusions of the professional group. Owing to the limited edition, copies of the Report are available only for libraries or where they would be used by groups of people. (Apply to Miss E. M. Herlihy, Secretary, The City Planning Boards, 30 City Hall, Boston, Mass.)

Fire Protection

Four pamphlets issued by the National Fire Protection Association (International), 60 Batterymarch St., Boston, Mass., presenting in advance publication the following reports: "Committee on City Planning and Zoning," 31 pp.; "Safety to Life" (Building Exits Code Committee, American Standards Association), Revisions, Building Exits Code, 23 pp.; Committee on Laws and Ordinances, Oil Burner Ordinance, 8 pp.; Committee on Signaling Systems and Thermostats—(I) Municipal Fire Alarm Systems, complete revision, (II) Central Station Systems, revisions, 26 pp. These reports were for consideration at the annual meeting of the Association at Atlantic City, May 14-17, 1934. (Apply to the National Fire Protection Association.)

Roadside Improvement

A valuable study entitled "Roadside Improvement" has been issued (June, 1934) as Miscellaneous Publication No. 191 by the Bureau of Public Roads, United States Department of Agriculture. The subject is treated as one of the necessary elements of highway construction. The divisions of the study as given are: roadside improvement in the Public Works highway program; state organization for landscaping; adequate right-of-way essential; selection and length of projects; partial roadside development possible; cost of improvement; preparation of plans; steep cut and fill slopes undesirable; landscape-planting plans; estimates of cost; methods of execution of landscape work; care and development of existing growth; material for planting; landscaping and the seasons of the year. The appendix contains a typical cost distribution sheet and summary of costs, and an excellent bibliography. Views, charts, planting plans. 37 quarto pp. 5c. (Apply to Superintendent of Documents, Washington, D. C.)

Municipal Accounting

The National Committee on Municipal Accounting in its Bulletin No. 3 (May, 1934) presents "A Bibliography of Municipal Accounting" as a guide to municipal officials and others who are interested in the financial affairs of cities, towns and villages, and other local governmental units, as they relate to accounting. The list is selective and includes books, bulletins, and pamphlets, current periodicals, and state municipal league magazines. 20 pp. (Apply to National Committee on Municipal Accounting, 850 E. 58th St., Chicago, Ill.)

Public Works Accounting

To assist the governments of public bodies in their handling of Public Works loan and grant funds and the accounting for expenditures under such funds, the Federal Emergency Administration of Public Works has prepared a "Manual of Financial and Accounting Procedure for Public Bodies." Many of the recommendations contained in it are applicable to any kind of municipal construction, and the Public Administration Service, of Chicago, which prepared the Manual for the Federal Public Works Administration, recommends it as profitable for study by city engineers and public works officials. March, 1934. 87 pp. (Apply to the Government Printing Office, Washington, D. C.)

Swimming Pools

A paper on "Modern Swimming Pool Construction," by E. H. Darling, M. E., consulting engineer, of Hamilton, Ont., has been reprinted from the *Canadian Public Health Journal*, September, 1933, having been presented before the Section of Public Health Engineering of the Canadian Public Health Association, in Toronto, May, 1932. The discussion of the correct principles of construction is illustrated by a description of the municipal swimming pool in Hamilton, Ont. 9 pp. (Apply to the Canadian Public Health Association, Spadina House, Toronto, Ont.)

Sanitation

Jahresbericht 1933, Ruhrverband, 8 pp.; "Die Arbeiten des Ruhrverbandes," 24 pp., by Dr.-Ing. K. Imhoff, Ruhrverband, Essen; and three 4-page pamphlets by the same author—"Die Stadentwässerung im natürlichen Kreislaufe des Wassers," "Die Abwasserreinigung," and "Abwassergenossenschaften." (Apply to Ruhrverband, Essen, Germany.)

Power Plants

The Municipal Electric Utility Service of the Michigan Municipal League issued its Bulletin 1 on May 23, 1934, entitled "A Digest of the Census of Electrical Industries in the United States for 1932." It is an analysis of the quinquennial report of the U. S. Bureau of the Census, including a comparison of figures for 1927 and 1932, and other figures for operation of electrical industries for 1932 only. 8 mimeographed pp., this being 4 pp. of tables with explanatory comment. (Apply to the League, Ann Arbor, Mich.

Liquor Control

A report has been prepared by Paul Studenski, Associate Professor of Economics at New York University, for the Citizens' Committee for Sane Liquor Laws. It is a study of liquor taxes and license fees on liquor prices and illicit trade, under the title of "Taxation of Liquor," and was issued March 20, 1934. On the basis of this report the Committee has taken the stand "that the laws relating to the taxation and licensing of liquors should be framed with special regard to the elimination of the bootlegger and the illicit traffic in liquor, rather than the collection of revenues" and "that the most practical way of putting an end to bootlegging and its associated evils is to reduce taxation and license fees to a level at which the incentive for the illegal business ceases to exist." 44 pp. (Apply to the Committee, 485 Madison Ave., New York.)

Sewage Works

"Studies in Sludge Digestion": "Time and Rate of Sludge Digestion, and Their Variation with Temperature," by Gordon M. Fair and Edward W. Moore, Associate Professor of Sanitary Engineering, and Instructor in Sanitary Chemistry, respectively, Harvard Graduate School of Engineering; and "Digestion of Garbage," by Gordon M. Fair. Reprinted from the January and March, 1934, issues, respectively, of the *Sewage Works Journal*. 15 pp. (Apply to Harvard Engineering School, Cambridge, Mass.)

Public Safety

"Accident Facts," published annually by the tional Safety Council, gives in the 1934 issue exceedingly valuable material—statistical, with comments and explanation—on accidents classified as occupational, motor-vehicle, home, public (not motor-vehicle), steam railway, aviation, child, fires, with a survey of "all accidents." 63 pp. Charts, graphs, tables. (Apply to the National Safety Council, 20 N. Wacker Drive, Chicago.

Other Reports Received

BALTIMORE, MD.—Annual Report, City Collector, 1933. 13 pp.

BROOKLYN, N. Y.—Annual Report, Chamber of Commerce, year ending May 31, 1934. 24 quarto pp.

BUFFALO, N. Y.—Buffalo Municipal Research Bureau, Inc.: "A Study of the Municipal Auditoriums of Buffalo." June, 1934. 50c. (Apply to the Bureau, 323 White Bldg.)

CONCORD, N. H.—Annual Report, Board of Water Commisioners, 1933. 18 pp.

FALL RIVER, MASS.—Annual Report, Board of Finance, January, 1934. 30 pp.

FREDERICKSBURG, VA.—Annual Report of City, 1933. 62 pp.

HERKIMER, N. Y.—Annual Report, Municipal Commission, year ending February 28, 1934. 51 pp.

JAMESTOWN, N. Y.—Historical Sketch of Municipal Electric System, Financial Statements and Condensed Rate Schedules, 1934. 11 pp.

LYNCHBURG, VA.—Annual Report of City, 1933. 103 pp.

MCPHERSON, KANS.—Annual Report of City, 1933. 30 pp.

MILWAUKEE, WIS.—Annual Report, Common Council, 1933. 152 pp., besides inserts.

MINNEAPOLIS, MINN.—Annual Report, Fire Department, 1933. 49 mimeographed pp.

MOOSE JAW, SASK.—Financial Statement, 1933. 50 pp.

NEW YORK STATE.—Annual Report, State Board of Housing, 1933. 62 pp.

PHILADELPHIA, PA.—Annual Report, Fairmount Park Art Association, 1933. 65 pp.

RIDGEFIELD PARK, N. J.—Financial Report, 1933. 48 pp.

AN IMPROVED TECHNIQUE IN APPLYING FILLER

1 *A dilute "separating" mixture is sprayed on the brick.*

2 *Asphalt filler is generously applied, effectively filling and sealing the joints.*

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CONVENTIONS—WHEN AND WHERE

(Figures in parentheses following the name of the convention city indicate the estimated attendance other than local)

JULY 11-13.—VANCOUVER, B. C.
American Society of Civil Engineers. Annual convention. Secretary, George T. Seabury, 33 West 39th Street, New York.

JULY 12-14.—MARTINSVILLE, VA.
American Water Works Association—Virginia Section. Secretary, H. W. Snidow, 601 State Office Building, Richmond, Va.

JULY 19-22.—LYONS, FRANCE.
International Union of Local Authorities. Sixth congress. General Secretary, E. Vinck, 3 bis, Rue de la Régence, Brussels, Belgium.

JULY 20.—NEW YORK.
Conference on the Educational Plant and the City Plan. Chairman, Dr. N. L. Engelhardt, Teachers College, Columbia University, N. Y.

JULY 20-22.—QUEBEC, QUE. (100)
Union of Canadian Municipalities. Annual convention. Secretary, Samuel Baker, City Clerk, London, Ont.

JULY 25-27.—MICHIGAN CITY, IND. (250)
Indiana Association of Chiefs of Police. Annual meeting. Secretary-Treasurer, A. G. Eversole, 104 South Fourth Street, Lafayette, Ind.

JULY 29—AUGUST 3.—STANFORD UNIVERSITY, CALIF.
Western School for Commercial Secretaries. Manager, Leonard E. Read, 304 Merchants Exchange Building, San Francisco, Calif.

AUGUST 6, WEEK OF.—CHICAGO, ILL.
National Institute for Commercial and Trade Organization Executives. Annual session. Secretary, John N. Van der Vries, 607 First National Bank Building, Chicago, Ill.

AUGUST, SECOND WEEK OF.—RICHFIELD, UTAH. (300)
Utah State Municipal League. Annual convention. Secretary-Treasurer, P. K. Nielsen, Price, Utah.

AUGUST 16-17.—HARRISBURG, PA.
League of Cities of the Third Class in Pennsylvania. Annual convention. Secretary, Herman A. Early, City Hall, Harrisburg, Pa.

AUGUST 20-24.—NEW YORK.
National Association of Public School Business Officials. Annual meeting. (Hotel Astor). Secretary, John S. Mount, State Department of Public Instruction, Trenton, N. J.

AUGUST 21-24.—MILWAUKEE, WIS.
International Association of Fire Chiefs. Annual convention. Secretary, James J. Mulcahey, Yonkers, N. Y.

AUGUST 21-23.—WATERLOO, IOWA. (400)
League of Iowa Municipalities. Annual meeting. Secretary-Treasurer, Frank G. Pierce, Marshalltown, Iowa.

AUGUST 21-23.—WINDSOR, N. S. (250)
Union of Nova Scotia Municipalities. Annual convention. Secretary, Hon. Arthur Roberts, Bridgewater, N. S.

AUGUST 22-24.—WHEELING, W. VA.
American Water Works Association—Central States Section. Annual convention. Secretary, H. L. Nelson, 2435 Koppers Building, Pittsburgh, Pa.

AUGUST 25-27.—WILLIAMSPORT, PA. (300)
Pennsylvania Chiefs of Police Association. Annual convention. Secretary, F. B. Titus, Chief of Police, Lansdowne, Pa.

AUGUST 27-29.—WHITE PLAINS, N. Y. (100)
National Identification Association. Annual convention. Secretary-Treasurer, E. W. Livingston, Jamesville, N. Y.

AUGUST 27-29.—BINGHAMTON, N. Y. (200)
New York State Association of Chiefs of Police. Annual convention. Secretary-Treasurer, James L. Hyatt, 503 Western Avenue, Albany, N. Y.

AUGUST 28-30.—TORONTO, ONT.
Ontario Municipal Association. Annual meeting. Secretary-Treasurer, H. L. Brittain, 137 Wellington Street W., Toronto, Ont.

AUGUST 29—SEPTEMBER 1.—WASHINGTON, D. C.
International Association of Municipal Electricians. Annual convention. (Wardman Park Hotel.) Secretary, W. H. Harth, Columbia, S. C.

AUGUST 30-31.—PITTSBURGH, PA. (200)
National Shade Tree Conference. Annual convention. Secretary-Treasurer, Dr. R. P. White, New Jersey Agricultural Experiment Station, New Brunswick, N. J.

SEPTEMBER 3-7.—SALT LAKE CITY, UTAH.
American Institute of Electrical Engineers. Annual convention. Assistant National Secretary, H. H. Henline, 33 West 39th Street, New York. Direct inquiries to General Convention Committee, 1016 Continental Bank Building, Salt Lake City, Utah.

SETEMBER 3-6.—PASADENA, CALIF.
American Public Health Association. Annual meeting. Acting Executive Secretary, Dr. Kendall Emerson, 450 Seventh Avenue, New York.

SEPTEMBER 3-8.—MUNICH, GERMANY. (700)
Permanent International Association of Road Congresses. Seventh International Road Congress. Thomas H. MacDonald, Secretary General, American Organizing Committee, 1723 N Street N. W., Washington, D. C.

SEPTEMBER 5-6.—PASADENA, CALIF. (150)
California Sewage Works Association. Annual convention. Secretary, Prof. E. Reinke, Life Sciences Building, University of California, Berkeley, Calif.

SEPTEMBER 11-13.—MURRAY BAY, QUE.
Canadian Good Roads Association. Annual convention. Secretary-Treasurer, George A. McNamee, New Birks Building, Montreal, Que.

SEPTEMBER 11-13.—AKRON, OHIO. (200)
Ohio State Police Chiefs Incorporated. Annual convention. Secretary, E. G. Krause, 1020 Guardian Building, Cleveland, Ohio.

SEPTEMBER 12-14.—FORT WAYNE, IND. (500)
Municipal League of Indiana. Annual convention. Executive Secretary, S. E. Spurgeon, Municipal League Review, Kokomo, Ind.

SEPTEMBER 16-21.—LOUISVILLE, KY. (300)
American Institute of Park Executives and the American Park Society. Annual convention. Executive Secretary, William H. Walker, 2234 Inglewood Place, South Bend, Ind.

SEPTEMBER 17-19.—SANTE FE, N. MEX.
American Water Works Association—Rocky Mountain Section. Annual meeting. Secretary-Treasurer, B. V. Howe, 437 State Office Building, Denver, Colo.

SEPTEMBER 17-19.—PLACE NOT DECIDED. (100)
American Water Works Association—Wisconsin Section. Secretary, L. A. Smith, Superintendent, Water Works, City Hall, Madison, Wis.

SEPTEMBER 17-19.—PHILADELPHIA, PA.
Municipal Finance Officers' Association of the United States and Canada. Annual convention. Executive Director, Carl H. Chatters, 850 East 58th Street, Chicago, Ill.

SEPTEMBER 18-19.—HERINGTON, KANS. (250)
Kansas Association of Municipal Utilities. Annual convention. Secretary-Treasurer, L. C. Angevine, Superintendent, Water and Electric Department, McPherson, Kans.

SEPTEMBER 18-21.—BOSTON, MASS.
New England Water Works Association. Annual convention. Secretary, Frank J. Gifford, 715 Tremont Temple, Boston, Mass.

SEPTEMBER 19-20.—STAUNTON, VA. (300)
League of Virginia Municipalities. Annual convention. Executive Secretary, Morton L. Wallerstein, 902 Travelers Building, Richmond, Va.

SEPTEMBER 21-22.—HAGERSTOWN, MD. (200)
Eastern Association of Fire Chiefs. Annual convention. Secretary, F. E. Soule, Coatesville, Pa.

SEPTEMBER 24-27.—ROCHESTER, N. Y.
American Society of Municipal Engineers. Annual convention. Secretary, C. W. S. Sammelman, 4359 Lindell Boulevard, St. Louis, Mo.

SEPTEMBER 24-28.—CLEVELAND, OHIO.
American Transit Association. Annual convention. General Secretary, Guy C. Hecker, 292 Madison Avenue, New York.

SEPTEMBER 24-27.—LOUISVILLE, KY. (400)
Association of American Cemetery Superintendents. Annual convention. Secretary, William B. Jones, Superintendent, Highwood Cemetery, Pittsburgh, Pa.

SEPTEMBER 24-27.—PASADENA, CALIF. (2,000)
League of California Municipalities. Annual convention. Executive Secretary, J. W. Charlesville, 681 Market Street, San Francisco, Calif.

SEPTEMBER 24-27.—WASHINGTON, D. C.
International Association of Chiefs of Police. Annual convention. Secretary, George Black, Chief of Police, Wilmington, Del.

SEPTEMBER 26-28.—ROCHESTER, N. Y.
International Association of Public Works Officials. Annual convention. (Sagamore Hotel.) Secretary, A. M. Anderson, 100 North LaSalle Street, Chicago, Ill.

OCTOBER 1-5.—WASHINGTON, D. C. (600)
National Recreation Association. National Recreation Congress. Secretary, Howard S. Braucher, 315 Fourth Avenue, New York.

OCTOBER 1-4.—BALTIMORE, MD. (450)
Illuminating Engineering Society. Annual convention. General Secretary, D. W. Atwater, 29 West 39th Street, New York.

OCTOBER 1-5.—CLEVELAND, OHIO.
National Safety Council. Annual congress. Managing Director, W. H. Cameron, 20 North Wacker Drive, Chicago, Ill.

OCTOBER 2-3.—CLEVELAND, OHIO. (150)
Institute of Traffic Engineers. Annual meeting. (Hotel Cleveland.) Secretary-Treasurer, Hawley S. Simpson, 175 Fifth Avenue, New York.

OCTOBER 15-17.—ST. LOUIS, MO. (300)
International City Managers' Association. Annual convention. Executive Director, Clarence E. Ridley, 850 East 58th Street, Chicago, Ill.

OCTOBER 15-18.—WACO, TEXAS. (350)
Southwest Water Works Association. Annual convention. (Hotel Hilton.) Secretary-Treasurer, Lewis A. Quigley, Fort Worth, Texas.

OCTOBER 18-20.—KNOXVILLE, TENN. (200)
The American Forestry Association. (Hotel Andrew Johnson.) Executive Secretary, Ovid Butler, 1713 K St., N.W., Washington, D. C.

OCTOBER 21-24.—CINCINNATI, OHIO. (300)
National Association of Commercial Organization Secretaries. Annual convention. (Hotel Netherland-Plaza.) Secretary, Glen B. Eastburn, Manager, Chamber of Commerce, Omaha, Nebr.

NOVEMBER 8-10.—OMAHA, NEBR.
American Water Works Association—Missouri Valley Section. Annual meeting. Secretary, Earle L. Waterman, University of Iowa, Iowa City, Iowa.

NOVEMBER 8-10.—CORAL GABLES, FLA. (300)
Florida League of Municipalities. Annual convention. Secretary, E. P. Owen, Jr., 1709 Barnett National Bank Building, Jacksonville, Fla.

NOVEMBER 12-15.—SANTA FE, N. MEX. (300-400)
American Association of State Highway Officials. Executive Secretary, W. C. Markham, 1222 National Press Building, Washington, D. C.

NOVEMBER 16-19.—WASHINGTON, D. C. (400)
American Country Life Association. Executive Secretary, Benson Y. Landis, 105 East 22d Street, New York.

English Town Planning Institute to Hold Summer School at Oxford

The Second Town and Country Planning Summer School will be held September 24-30 at St. Peter's Hall, Oxford, England, under the auspices of the Town Planning Institute. The program will include lectures and discussion classes on national planning, town and country planning, industrial planning, housing and public health. The cost of attending for the full week, including registration fee, board, lodging and all sessions, will be £4. 5s. 6d. Reduced fees are provided for those able to stay for only a part of the session. Full information, including a detailed program, can be obtained from T. T. McCrosky, City Planning Commission, City Hall, Yonkers, N. Y.

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Trinidasco—the Native Lake asphalt mixture that is laid cold—is prepared with the same grades of stone, sand and other mineral aggregate and Trinidad Lake Asphalt used since 1876 in the construction of standard types of Trinidad hot-mix pavements.

Trinidad is the safest asphalt for durability. Trinidasco cold-laid pavements have a high coefficient of friction, and are safe for modern traffic.

Trinidasco cold-laid pavements are used for new construction . . . for resurfacing . . . for maintenance. Trinidasco is convenient . . . can be laid with hand tools or mechanical devices immediately after preparation, or from stock piles.

Specifications and full particulars covering mixtures for asphaltic concrete, asphalt macadam and sheet asphalt (binder and top) pavements furnished on request.

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SINCE 1907

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Above: Coldwell "L-Twin" motor lawn mower and roller. Mows and rolls simultaneously 4 to 6 acres a day. With gang units attached it cuts a 60-inch swath, ten acres a day.

COLDWELL DEPENDABLE POWER LAWN MOWERS AND ROLLERS . .

. . . pay dividends in the form of efficient work, plus savings in upkeep.

Years of *dependable* service are assured at the minimum of outlay.

Every unit is designed for the particular job it has to do, and the entire machine, including the motor, is built in our own plant.

Ask for details of the many new and improved features.

A demonstration may be arranged.

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NEWBURGH, N. Y., U. S. A.

In Canada—Taylor Forbes Co., Ltd., Guelph
Manufacturers of ***DEPENDABLE*** *Lawn Mowers* — HAND, HORSE, GASOLINE, ELECTRIC

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Mark Your Zones With Traffic Zone Paint—*Because*

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MOHAWK ASPHALT HEATER CO.

Frankfort New York

NEWS AND ILLUSTRATIONS

Items of Interest to City, Town and County Officials, and Others Concerned with the Economical Construction and Efficient Operation of Public Improvement Undertakings

A New Diesel Auto Patrol

The Caterpillar diesel Auto Patrol brings together the proved economy of the diesel engine and the proved efficiency of a leading road maintenance machine, according to the manufacturer, Caterpillar Tractor Co., Peoria, Ill. Neither unit is new, for the 3-cylinder, 4-cycle diesel engine has seen service in hundreds of diesel Thirty-Five tractors and power units, and the Auto Patrol has been popular for road maintenance and oil-mix work for several years.

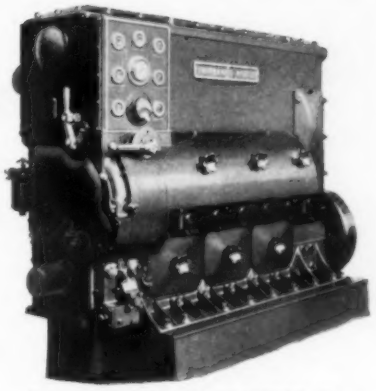
Among the features claimed for this machine are outstanding fuel economy, increased power, greater capacity, heavier frame, additional weight, and greater lugging ability. The engine develops 47 maximum brake horsepower at governed speed of 850 rpm, and the machine has a shipping weight of 15,150 pounds. Full power control of all blade adjustments, rear-mounted engine, positive drive to dual rear wheels, elimination of the differential, four forward speeds, heavy structural steel circle, and extra-wide 12-foot blade equipped with end bits, make the machine adaptable for all kinds of maintenance work, including regrading and snow-plowing.

A New Opposed-Piston Diesel Engine

Light weight and reduced space requirements are features of the new opposed-piston diesel engine recently announced by Fairbanks, Morse & Co., 900 South Wabash Avenue, Chicago, Ill. The weight of this engine has been brought down to 20 pounds per hp, and at the same time improved scavenging and a greater virtual stroke-bore ratio have resulted in improved combustion efficiency. The construction has been greatly simplified by a substantial reduction in the number of parts. Engines of the opposed-piston type are inherently balanced because the reaction forces of the two pistons in the cylinder oppose and tend to counteract each other, leading to higher rotative and piston speeds with a consequent reduction in weight.

Among the features of this new engine are two short large-diameter crankshafts with a synchronizing connection, making for compactness; the three functions of regulating injection timing, pressure and quantity centered in a single lever; rapid and accurate response; and the engine may be changed from idling to full speed in only a few revolutions or maintained indefinitely at any intermediate speed within very narrow limits.

These engines are available in five cylinder sizes, 5 x 6-inch, 6½ x 8-inch, 8 x 10-inch, 10 x 12-inch and 12 x 15-inch, and in 6-, 7- and 8-cylinder combinations with a 5-cylinder size in the smallest bore. Power capacities range from 50 to 300 hp per cylinder or from 250 to 2,400 hp for the engine. While these engines were designed primarily for installations where weight and space are important factors, such as for mobile equipment, they are equally adaptable for stationary work.



THE NEW FAIRBANKS-MORSE OPPOSED-PISTON DIESEL ENGINE

The June Cover

The attractive front cover of the June issue of THE AMERICAN CITY, showing the Kensico Reservoir Dam of the New York Water Supply, was furnished through the courtesy of Walter E. Spear, Acting Chief Engineer, Board of Water Supply, New York City. A visit to Kensico Reservoir was one of the features of the Friday bus trip which concluded the American Water Works Association convention held at the Hotel Commodore, New York City, June 4-8. This outstanding convention showed conclusively the increasing interest in water works and was featured by large attendance and unusually attractive and instructive exhibits by water-works manufacturers.

Through an oversight, our acknowledgment of Mr. Spear's courtesy was omitted from the June issue of THE AMERICAN CITY.

Pittsburgh Equitable Sends Message on Record-Breaking Flight

The Pittsburgh Equitable Meter Co. and the Merco Nordstrom Valve Co., of Pittsburgh, Pa., took advantage of Colonel Roscoe Turner's record-breaking flight between Pittsburgh and Chicago to congratulate Rufus C. Dawes on the success of the 1933 World's Fair and to extend their greetings on the opening of the Second Exposition for 1934.

The 104-minute flight, at an average speed of 240 miles per hour, shows the progress made in transportation, just as the exhibit of Pittsburgh Equitable and Merco Nordstrom at A Century of Progress depicts the progress made in the measurement and control of water, gas, oil, gasoline and other fluids.

A Transparent Surface Waterproofing

A transparent water-repellent for absorptive surfaces, such as concrete, brick, concrete products, stucco and stone, is manufactured by the Johnson-March Corporation, 52 Vanderbilt Avenue, New York. Klearkote is a scientifically compounded surface waterproofing, containing both mineral and vegetable materials, so colloidally dispersed that when deposited in the pores of an absorptive surface, it is rendered permanently water-repellent. It does not change the appearance of the surface treated and does not fill the pores, but it does make the surface non-absorptive and water-repellent.

Klearkote is applied freely, preferably in two coats, the second following within five minutes. One gallon will cover from 10 to 15 square yards, depending on the absorption of the surface treated. As soon as it is dry and set, absorption has stopped, and any remaining material on the surface should be wiped off.

Hamaker Made Official of Berger

Republic Steel Corporation, Youngstown, Ohio, has announced the appointment of L. S. Hamaker, its Sales Promotion Manager, to the position of Vice-President and General Manager of the Berger Manufacturing Co., Canton, Ohio, a wholly owned subsidiary of Republic. Mr. Hamaker began his career in the steel industry in the Sales Department of the Berger Manufacturing Co. and later was made Advertising Manager. During a series of mergers he became Advertising Manager of United Alloy Steel Co., Central Alloy Steel Corporation, and finally of Republic Steel Corporation. He was appointed Sales Promotion Manager of Republic in 1931.

Gas Station Designed to Preserve Rare Tree

One of the country's most unusual gas stations has just been completed at Greenwich, Conn. It is "built around a tree" and is of Colonial architecture to harmonize with the design of most of the buildings in the community. When officials of Standard Oil Co. of New York, Inc., a Socony-Vacuum company, decided to build a station at Putnam Avenue and Sherwood Place, Greenwich, they were faced with the problem of cutting down a fine specimen of a Japanese ginkgo tree.

The architect who designed the station arranged it so that the ginkgo tree would remain, and the result is an unusual station that has all the appearance of a Colonial mansion, and the tree stands in all its glory protected by an iron fence.

"6,784,193 GALLONS

up to ten o'clock . . . *sure I know exactly; what do you suppose we have SPARLING Meters and Recorders for . . . absolutely, if the SPARLING says so, it IS so . . . Goodby."*

Engineer Smith is speaking—one of the thousand up-to-date superintendents throughout the United States who always KNOW the facts because they have Sparling Metering, Totalizing and Recording Equipment.

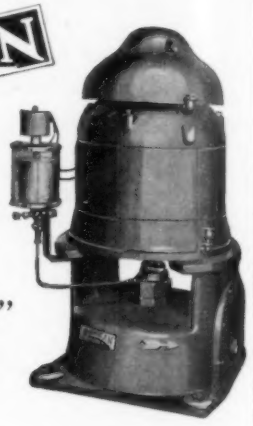
There are good reasons why the Sparling Main-Line Measuring Equipment has been so widely adopted by progressive cities and large corporations.

Bulletin 302A tells about it. Ask your nearest office for a copy.

R. W. SPARLING

NEW YORK 101 Park Ave. | CHICAGO 3104 So. Michigan Ave. | LOS ANGELES 945-51 No. Main St.

AMERICAN AURORA, ILL.



NEW "AMERICAN" TURBINES

The new "American" Turbines have all the features that have made them standard equipment in municipal pumping stations for many years—efficiencies that materially reduce the present cost of pumping water. These new turbines are designed for wells as small as 6 in. in diameter, and are equipped for either oil or water lubrication. "American" engineers and sales offices will gladly furnish data to municipal engineers or officials on this new, low pumping cost turbine.

THE AMERICAN WELL WORKS

General Offices and Factory
AURORA, ILLINOIS
Branch Offices
CHICAGO NEW YORK
Agencies in all principal cities

Cast Iron Pipe

for Water and Gas

Cast Iron Pipe and Special Castings, Bell and Spigot, Flange, Flexible Joint, Culvert, Milled and Plain End Tubes, Cylinders, Flanged and Bell and Spigot Fittings, High Pressure Fire Service Pipe, Warren Short Body Specials.

Size 2 to 84-inch

Pipe manufactured in accordance with standard specifications adopted and approved by water works associations and engineers.

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11 Broadway, New York City

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75 Federal Street, Boston, Mass.

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NATIONAL METER COMPANY

Catalogs on request. Write to National Meter Company, 4207 First Avenue, Brooklyn, N. Y., (or nearest Branch Office in Boston, Chicago, Los Angeles, or San Francisco).

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COMFORT — CONVENIENCE

Two Blocks From Grand Central
Few Minutes From Pennsylvania Station
In the Heart of the Shopping & Theatre District

All Rooms With Bath

EUROPEAN PLAN
From **$2.50 Single**
$3.50 Double

TWO ROOM SUITES
From **$4.00 Single**
$6.00 Double

The **WEBSTER**
40 West 45th Street, New York City
F. W. BERGMANN, MGR.
Formerly Mgr. Pennsylvania Hotel, New York, N. Y.—Shelton Hotel, N. Y.

DISTRIBUTION CONDUITS OF TRANSITE WITHOUT CONCRETE ENVELOPE

Conduit Pipe for Use in the Electrical Field

Johns-Manville, 22 East 40th Street, New York, has brought out Transite conduit, which is well suited for electrical conduit and has found many applications in this field during the last few years. Like other Transite products, this conduit is composed of asbestos fiber and portland cement. These enduring basic materials are combined under pressure by a method which permits accurate control of the distribution of ingredients, wall thickness and density, thus insuring uniformity. In manufacture, the conduit is built up on a polished steel mandrel which imparts a very smooth interior surface.

Transite conduit has a close grain structure and weighs approximately 125 pounds per cubic foot. Compared to ordinary concrete, it has four times the tensile strength and twice the compressive strength. It is fireproof, highly resistant to external and internal corrosion, electrolysis and the action of many chemicals. The mechanical properties of Transite conduit are such as to recommend it for underground as well as overhead use. It will stand all ordinary stresses and abuses incidental to shipment, handling, installation and operation, as both an underground and an exposed conduit. Its workability is such that it can be readily cut and tooled on the job. It is comparatively light in weight, a property which, combined with its strength, makes possible the use of relatively long lengths.

This conduit has many applications in the electrical field. As an underground conduit without a concrete envelope, Transite conduit has been used for services from manholes to buildings and from manholes to pole risers. As an underground conduit, encased in concrete, it has found many applications where conditions are unusually severe, such as on bridges, and for underwater duct structures, particularly where severe soil and water conditions are involved. As an exposed conduit and buss protector, it has met with general favor. Since it is non-metallic, there are no induction losses when it is placed around conductors carrying only one phase of alternating circuit. Its light weight and ruggedness also recommend it for this purpose, and because of its unusual resistance to corrosion and vibration it is adaptable for use as rail jumpers.

Being sufficiently rugged, it can be readily handled and stored by ordinary workmen. It may be stored in the open or under cover to any convenient height, and is not affected by weather or frost and will not deform under the heat of the sun, regardless of length of exposure.

A New Valve-Seating Unit Machine

A new Limitorque operated machine built on sound gearing principles has been announced by the Philadelphia Gear Works, Limitorque Division, Philadelphia, Pa., This new machine is a self-contained motor-driven worm gear reducing unit with electrical and mechanical limit switches, all of which is contained in one oil-tight casing and bolted to the valve top. Although it was originally developed for valves, it is adaptable to any mechanism having a predetermined movement of a shaft that has to be stopped or reversed at the end of each movement. In its design is incorporated a mechanical overload device to protect the valve stem against breakage. It has a switch ensuring tight seating to any desired degree. This machine can be used with valves in steam generating stations, for boiler lead, boiler feed, pump suction header, condenser service, steam heating plants, hydro-electric plants, water works, gas manufacturing plants, steel plants, paper making, marine and naval use, etc.

Westinghouse Receives Large Order for Concrete Piles

Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa., has announced the receipt by its St. Louis works of a record order for Hollowspun concrete tapered piles, specifying delivery of 4,300 units for Twin Locks No. 26 at Alton, Ill. This project is a unit in the development of the 9-foot navigable channel on the Mississippi River from the conjunction with the Missouri River to Minneapolis, the entire project being developed by the U. S. Engineers Corps. Approximately 138,000 feet of concrete piling will be used, the piling being driven into the river bed to support the lock walls.

A New Bulletin on Gate Valves

A new bulletin on gate valves for municipal water-works distribution systems has been published by The Kennedy Valve Manufacturing Co. The bulletin explains the Kennedy Newtype Water Gate design in detail, showing a sectional view of the valve and the separate parts of the operating mechanism, and includes complete specifications and dimensions. Various methods of operation and special arrangements are also described and illustrated. These valves conform with specifications of the American Water Works Association in all respects and are built in sizes from 4- to 12-inch for 200-pound working water pressure, and in sizes from 14- to 60-inch for 150-pound working water pressure. Copies of the bulletin may be obtained by addressing The Kennedy Valve Manufacturing Co., Elmira, N. Y., and asking for Bulletin 32.

Dean of New York Sanitary Engineers Dies

George Warren Fuller, eminent sanitary engineer and internationally known expert on water supply and sewerage, died on June 15, after a brief illness, at his New York City residence. He was for many years the senior member of Fuller & McClintock, consulting engineers, 11 Park Place, New York. After graduating from the Massachusetts Institute of Technology, in 1890, he studied in Berlin, later was placed in charge of the Lawrence Experiment Station of the Massachusetts State Board of Health, conducted experiments in Louisville in 1895, on the suitability of various processes of water filtration, and then continued similar researches at Cincinnati.

In 1917 and 1918, during the World War, he was a member of a Central Committee at Washington having to do with the engineering, planning and sanitation of the various army camps. One of the many important works performed by Mr. Fuller in his special field of engineering was accomplished in 1924 and 1925 for the Sanitary District of Chicago when, as Chairman of the Board, he passed on the advisability of installing a new system of disposing of the sewage of the lake metropolis. He was recalled this year by the Government to advise a special Board of Review on the progress made in this great improvement.

For many years Mr. Fuller was intimately connected with the improvement of sanitary conditions in New York City, serving as consultant on sewerage and sewage disposal for the Metropolitan Sewerage Commission of New York, and in 1928 he reported to the city upon the Ward's Island sewage treatment works and later his firm prepared the plans for this $16,000,000 project, which is now partially constructed. From 1906 to date, he was consultant to the New York Board of Water Supply on various problems connected with the development of the Catskill reservoirs and supply system. During his professional career Mr. Fuller served as consulting engineer for major water works and sewerage improvements in more than 150 large cities in this country and abroad.

Shortly before his death, Mr. Fuller had agreed to prepare a review of sewage disposal for THE AMERICAN CITY to appear in the Sewage Disposal section of the 1934 Municipal Index. This paper, "The Present Status of Sewage Disposal in the United States," has instead been prepared by Wellington Donaldson, of Fuller & McClintock. The group of engineers who have been associated with Mr. Fuller in this firm for many years, and who will continue his work in water supply and purification, sewerage and sewage disposal, garbage collection and disposal, the disposal of industrial waste and the valuations and rate investigations, include the surviving partner, F. G. Cunningham, and C. A. Emerson, Jr., Elmer G. Manahan, Wellington Donaldson, E. W. Whitlock and H. K. Gatley.

A tough, skid-proof locker-room floor!

Usually located in basements . . . frequently with concrete floors . . . with abusive traffic (including cleated or spiked shoes) . . . and many times connecting directly with showers, locker rooms afford baffling flooring problems. Just ONE floor covering answers all requirements . . . MASTIPAVE. Tough . . . self-healing, if lacerated . . . SLIP-PROOF EVEN WHEN WET . . . impervious to underground moisture . . . rot-proof, vermin-proof and acid-proof . . . it costs but little to install, with practically no upkeep. Write for booklet AC.

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Branches in Principal Cities

THE COTT-A-LAP CO.
Somerville, New Jersey

THE LOW-COST, LONG-LIFE FLOOR COVERING

MASTIPAVE

THE NEW

FORD V·8 TRUCK

Gives you all these features

- Full-floating Rear Axle
- Special 80-horsepower V-8 Engine
- Heavy-duty Clutch
- Trouble-free 4-speed Transmission

NO COMPROMISE WITH PASSENGER CAR DESIGN . . .
A REAL TRUCK . . . MADE OF GENUINE TRUCK PARTS

Asphalt Distributors Asphalt Kettles
Tool Boxes Oil Burners
Lead Furnaces
Emulsion Sprayers Surface Heaters

LITTLEFORD BROS.
500 EAST PEARL STREET
CINCINNATI, OHIO

IN PHILADELPHIA
In the Heart of Things

Here one may live graciously, yet inexpensively . . . where modern luxuries combine with friendly hospitality to assure an enjoyable visit.

You may properly expect precise, thoughtful service . . . and a cuisine that is one of the enduring traditions of this world-famous hotel.

Claude H. Bennett
General Manager

BELLEVUE STRATFORD

No Substitution on Gas Masks and Safety Equipment Parts

Under NRA Approved Code No. 315 for the industrial safety equipment industry and trade, it is not permissible for any member to offer for sale or to sell a part of any approved safety equipment for substitution or for replacement unless the part be manufactured by the manufacturer of the original approved equipment.

Rule No. 14, entitled "Quality Maintenance of Parts," is quoted from this Code: "No member of the industry and/or trade shall offer for sale or sell a part of any industrial safety equipment, approved by the Bureau of Mines, the Bureau of Standards, the American Medical Association or the American Gas Association, or any other Bureau or Association approved by the Code Authority, with the consent of the Administrator, for substitution or for replacement of a part of such approved equipment except such be a part manufactured by the manufacturer of the original approved equipment, or such be a part of equal or superior merit approved for substitution or replacement by the original approving Bureau or Association."

This section of the Code was included for the protection of police and fire departments using such approved equipment as gas masks, rescue apparatus, and resuscitating devices, so as to prevent any one from selling a part of the apparatus which, when installed, might endanger the life of the user. For example, there are several different types of gas mask canisters on the market, each type containing chemicals for protection against certain gases or combinations of gases. One can readily understand the hazard of using a gas mask equipped with a canister which the wearer believes will give protection but which actually is a canister developed for some other use than that for which it is being used.

Manufacturers' Representatives Available

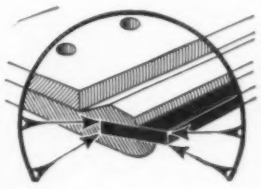
Paul K. Fleming & Associates, 232 East Erie Street, Chicago, Ill., are in a position to act as manufacturers' representatives in the central district for several lines of products. This firm has had twelve years of experience in municipal and industrial selling.

Chevrolet Announces Price Reduction

Increased automotive sales, already at a high peak, and prolonged factory employment, are expected by the Chevrolet Motor Co., Detroit, Mich., as a result of the price reduction now in effect on all Chevrolet passenger cars and trucks. The reduction, announced June 1, brings all Chevrolet trucks to the lowest prices since the introduction of the 1934 line. The reduction on most models was as high as $50 and places Chevrolet with the lowest-price line in the truck field. No changes whatever have been made either in the product or in the equipment included in its price.

Five-Year-Old Mower Blades Still in Use

Over five years ago, the Budd Manufacturing Co., Ravenna, Ohio, brought out the new Budd bed blade, for mowers used in the maintenance of lawns, public parks and surrounding public buildings. Since that time, improvements have been made, so that the unusual efficiency of the original unit has been increased. Some of the original Budd bed blades, which are almost obsolete compared to today's type, are still on the job, giving



THE BUDD BLADE, SHOWING THE FOUR KEEN CUTTING EDGES, ANY ONE OF WHICH CAN BE BROUGHT INTO SERVICE INSTANTLY

satisfactory performance. Among the many features of the present-day Budd blade is its four cutting edges, assuring a razor-sharp edge four times the length of the ordinary blade. Grass is cut quicker, cleaner and with less effort. When an edge begins to dull, the operator simply switches the blade to put a fresh edge in position, much the same as changing a double-edge razor blade. Lay-ups and sharpening delays are thus reduced, and bed-knife warping is eliminated.

Budd bed blades are now machined for use on all mowers in common use, and a special tension plate is furnished gratis with each unit. This convenience permits cutting as short as the operator desires, and its elimination permits several seasons' additional use of the mower after the reel has run out of adjustment under ordinary conditions.

A Unique Iron Body Gate Valve Cut-Out

A novel piece of advertising literature has recently been produced by Jenkins Bros., 80 White Street, New York, in the form of a replica of a Jenkins iron body gate valve for water-works service. This cut-out is next best to having the gate itself for inspection, since it provides an exact reproduction of both the exterior and the mechanism of a heavy valve. An accurate listing of the features of Jenkins design and construction also is given in a form which makes it convenient for valve users to follow the suggestion to "compare point-for-point with other good valves and let your own judgment say which one is best."

Road Machinery Company Moves Offices

Austin-Western Road Machinery Co. has announced that its offices, as well as the offices of the new Western-Austin Co., a merger of the Austin Manufacturing Co. and the Western Wheeled Scraper Co., will be located at Aurora, Ill., after July 1. The Austin-Western Road Machinery Co. will continue to act as the sales company for the Western-Austin Co.

Donald R. Johnson Dies

Donald R. Johnson, for many years Vice-President of Edward E. Johnson, Inc., Saint Paul, Minn., manufacturers of well screens, died early in June. The brief memorial statement issued by Edward E. Johnson, President, is worthy of repetition here: "It is with deep sorrow that we record the passing of Donald R. Johnson, our son and Vice-President of our firm. Working side by side with us, he devoted the whole of his energies to the upbuilding of this institution, until ill health forced his retirement some years ago. His devotion and the courage with which he faced the long and hopeless illness have left with us a great and permanent memorial of him."

Cabot Company Strikes Big Oil Gusher

The largest oil well to be struck in the Gilmer County district of West Virginia in many years was recently brought in by Godfrey L. Cabot, Inc., 940 Old South Building, Boston, Mass., in its A. H. Blackshire tract holdings. The "pay" was struck in Berea grit at a depth of 2,108 feet. Starting at 2 o'clock in the morning, oil spouted from the well at a rate of more than a barrel a minute for several hours and, despite frantic efforts to save it, more than 400 barrels escaped down Steer Creek nearby. The oil flow diminished somewhat later, but the output per day is still large for that section of the country. Godfrey L. Cabot, Inc., has extensive holdings in West Virginia, Texas and Oklahoma, and is well known as manufacturer of carbon black, which is made from natural gas, and Charon, a black pigment for concrete.

An Improved Highway Signal Torch

Improvement in the design of the Economy burner used in Toledo highway signal torches and truck flares, which makes for better appearance and stronger construction, has recently been announced by the Toledo Pressed Steel Co., Toledo, Ohio.

In place of a machined screw collar fastened onto the top of the torch shell, the new construction provides a heavier drawn collar which is imbedded in the torch body over a much wider area. The new collar conforms with the general lines of the torch body and produces a compact unit. It is claimed that the lower position of the hood in relation to the body of the torch also results in an improvement in performance, as well as facilitating the installation of the hood after filling. A second improvement is found in the new one-piece wick holder, the features of which are claimed to eliminate the bleeding of oil at any time, whether the torch is burning or not. The screw collar improvement will appear hereafter on all Toledo torches, with the exception of the Champion, and the wick holder will appear on all models.

How our packing cuts your street-lighting glassware costs

GLEASON-TIEBOUT street-lighting glassware is shipped in strong cartons of double-faced corrugated cardboard. Each globe in the carton is packed so that it will be independently protected from breakage. To you, this means a saving in time and money which otherwise might be lost in the replacement of glassware broken in transit; it means lower storage and handling losses in your own warehouses.

This is but one of many details that assure you satisfactory service when you specify Gleason-Tiebout glassware. For G-T glassware is a product of scientific engineering and modern manufacturing methods; it combines all the important factors required of a high-grade product.

Scientifically designed glassware is essential to correct illumination. It will help to provide greater protection for your city, and, consequently, give a high return on the investment by decreasing accidents and crime.

Gleason-Tiebout makes glassware to meet the exacting specifications of General Electric engineers. These engineers will be glad to assist you in planning installations that will meet every requirement.

●

A Gleason-Tiebout globe and canopy, used with a G-E Novalux luminaire—a decorative unit for White Ways and secondary business streets.

●

PROPER STREET LIGHTING PROMOTES SAFETY
DISCOURAGES CRIME AND BOOSTS BUSINESS

GT-39

GLEASON-TIEBOUT GLASS COMPANY

99 COMMERCIAL STREET, BROOKLYN, N. Y.

Outdoor Lighting

A Section of *The American City*
Devoted to the Lighting of Streets, Highways, Bridges, Airports, Athletic Fields and Parks, and the Floodlighting of Public Buildings

How Light Can Help to Combat Fire—The Service of the Floodlighting Truck

By R. P. JOHNSON

Industrial Division, Memphis Office, Westinghouse Electric & Manufacturing Company

THE Fire Departments of our large cities, realizing the necessity for apparatus to diminish the hazards involved when combating fires that occur after nightfall, have formulated plans for solving the problem. The principal requirement is the need of adequate lighting facilities.

In working out this problem several points had to be taken into consideration. First, it was necessary that the equipment be mobile; second, the electrical power for the lighting equipment had, in most cases, to be generated at the scene of the fire; and, third, three types of lighting equipment were needed to successfully take care of any condition that might arise. The exterior of the building on fire should be floodlighted; also, a powerful searchlight should be available for penetrating thick smoke; and provisions should be made for lighting the interior of the burning building, if necessary.

The problem was solved by the development of the floodlighting truck.

The joint Fire Department of the cities of Texarkana, Arkansas and Texarkana, Texas, realizing the need of such equipment, designed and built a floodlighting truck.

The Completed Truck

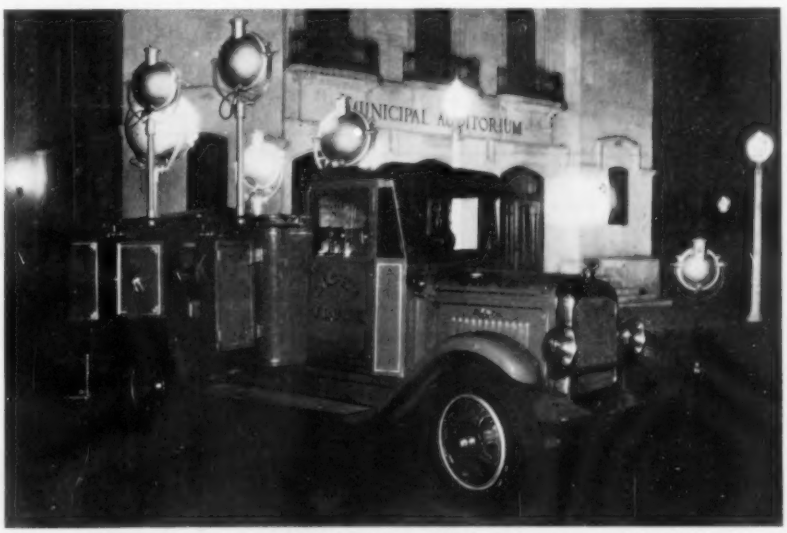
The truck body is made of sheet steel, cut, fitted and assembled in the Department's own shop. Equipment installed or carried inside the truck has been made accessible by means of the installation of collapsible doors.

The power plant consists of a 15-kw, 125-volt, direct-current generator driven by a 50-hp stationary gasoline engine. The engine and generator are mounted on steel beams directly over the rear wheels. The control panel for the generator is mounted in the driver's cab. On the panel are the generator field rheostat, carbon breaker, ammeter and voltmeter. A small incandescent lamp is mounted on each side of the control panel to enable the operator to read the instruments more readily.

Mounted on top of the truck are five 16-inch floodlights, each with a wide-angle reflector and a heavily stippled lens. These are used to floodlight the exterior of the burning building. Each of the 16-inch floodlights carries a 1,000-watt PS-52 lamp. As can be seen from the photograph of the equipment, the floodlights are supported on trunnions which allow movement in either a horizontal or a vertical direction. The trunnions are in turn mounted on adjustable posts which may be raised a maximum of 3 feet, and lowered by means of hand wheels mounted on the side of the truck body, near the top.

For the purpose of penetrating thick smoke, a 24-inch searchlight is mounted on the rear of the top of the truck and carries a 1,000-watt T-20 lamp. It is mounted in the same manner as the floodlights.

To take care of the problem of lighting the interior of the burning building, eight 14-inch portable floodlights have been provided. Each of these has a wide-angle reflector and a heavily stippled lens. They are mounted on trunnions to provide for vertical and horizontal move-



NIGHT VIEW OF FLOODLIGHTING TRUCK, SHOWING EQUIPMENT IN SERVICE

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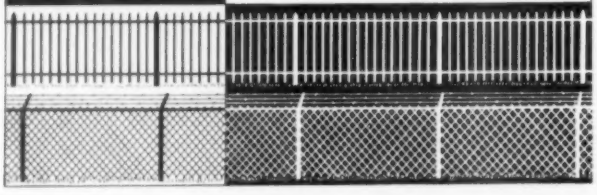

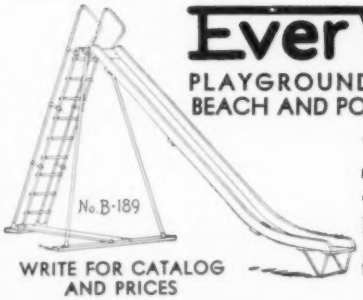

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STONO Cleans all types of granite—no streaking.

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ment, and the trunnions can be mounted either on flat bases or on tripods. The flat bases are used when it is necessary to take the lights inside a building, and the tripods may be used when it is necessary to floodlight an exterior portion of a building not accessible to the stationary lights mounted on top of the truck. The 14-inch floodlights each carry a 500-watt G-40 lamp.

In order for the portable lights to be useful, it is necessary that extension cables be provided. In each side of the rear of the truck is mounted a reel for carrying these cables. One of the reels carries 1,200 feet, and the other 1,000 feet of flexible rubber-covered cable. In addition to this, each floodlight is provided with 50 feet of the same cable to be used in case a short run is necessary.

All cable connections are made by means of three-way stage connectors, so that when necessary it is possible to have all the lights in service at one time, connected to either of the long extension cables. Two reels are provided to allow greater distribution of the lights in cases of necessity.

For purposes of identification and to eliminate theft as much as possible, the words "Texarkana Fire Department" are molded in the rubber covering of the cable at 3-foot intervals.

In case short extensions are desired and it is not feasible to connect the portable lights to the cable on the reels, the 50-foot extensions may be employed. The short extensions may be plugged into receptacles that have been installed on each side of the truck. The location of one of these can be seen near the front of the rear fender, by referring to the photograph. The other is located at the same position on the opposite side of the truck.

Each 16-inch floodlight is carried on one circuit. The 24-inch searchlight is carried on one circuit. Each reel of extension cable is carried on one circuit. Each plug receptacle is also carried on one circuit. These utilize a total of ten circuits. A 12-circuit No-Fuze panel has been provided, which leaves two circuits available for future use. The No-Fuze panel is mounted in the driver's cab, as shown in the photograph on page 97.

THE FLOODLIGHTING OF A LARGE BUILDING BY THE TEXARKANA TRUCK

The ease of combating a fire with the aid of such light is readily recognized

Street Lighting in Seattle, Washington

THE extensive lighting system in Seattle illuminates a total of 64 miles of streets with high-intensity lighting, and a total of 1,430 miles of lighted streets, with a total of 25,322 lamps, as reported in the local "Record of City Light for the Year 1933."

The white way posts, of statuary bronze, are 23 feet 8 inches high, and each carries two or three 500-watt, 950-candlepower lamps encased in light opalescent rippled or diamond mesh outer globes. This system was installed at a cost of $802,000 by the owners of the property abutting on the streets lighted, by the Local Improvement District plan. It is operated and maintained by City Light as part of the general street-lighting system of the city.

The New System

For many years all street lights in Seattle have been high-efficiency gas-filled lamps, using the 80-candlepower size as the minimum and grading up to special 3,000-candlepower overhead units at important traffic centers. Some years ago —as reported in the latest printed annual report of the Department of Lighting—a safety survey disclosed the fact that the overhead series street-lighting circuits, which represent standard practice in that work, were the most dangerous wires of all because of their universal extent and high voltage. After considerable work to develop a dependable low-wattage relay for turning on the lights, City Light began the installation of all new overhead lights on low-voltage multiple circuit, using the city-wide residence lighting bus as the source of energy and employing pilot wires and relays in cascade to control the lights. All districts of the city have been converted to this new system, which was extended as fast as the older circuits became inadequate, and in each district the change reclaims a considerable amount of overhead wire, eliminates all hazard to life and property and increases the reliability of the lighting, besides doing away with periodic burn-outs of all lamps on a circuit in time of a storm, and eliminating the greatest source of radio interference. In the new system the relays function in the daytime to disconnect the lamps, and trouble appears as lamps burning in the daylight, rather than lamps out at night—easier to locate and repair.

During 1933, City Light paid all its bills promptly when due, met interest and redemption payments aggregating $2,761,977.50, and maintained a cash balance of from $55,000 to $199,000 in the bank at all times during the year.

For the year 1934 the cost of street lighting has been cut to $375,000, or only 1.88 cents per kilowatt-hour for all current and maintenance replacement and operation.

The Illuminated Fountain at the National Capitol

IN the illustrated article on "The Art of Fountain Lighting," on page 103 of the April number of THE AMERICAN CITY, mention was inadvertently omitted of the work of Bennett, Parsons and Frost, architects, of Chicago, in connection with the design of the Washington fountain and other improvements in the Capitol grounds. In a letter to THE AMERICAN CITY, dated June 11, 1934, H. T. Frost, of the architectural firm, writes as follows:

"The Enlargement of the Capitol Grounds is a project which was designed by this firm under the jurisdiction of David Lynn, architect of the Capitol. We are responsible for it, including the design of the terrace, fountain and the garage beneath it, and its architecture, its power and electric plant and hydraulic and lighting effects. Standard mechanical and electrical equipment and products were used throughout. Experiments in water and light effects were made by the general contractor as a part of his contract under our direction, following a specified program until the desired effects were obtained.

"Our problem was one involving in addition to 'The Art of Fountain Lighting' the terrace lighting and reflection, and many months of study were given to it, to bring the illumination into harmony with the Capitol dome lighting."

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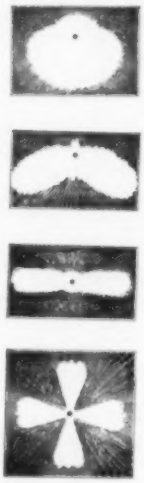
HOLOPHANE REFRACTORS

Shape the Light to the Street



(1) For wide streets—units at curb—closely spaced.

(2) For wider spacing—a longer reach of light.

(3) For highways—a long, narrow ribbon of light.

(4) For intersections—a separate beam for each roadway.

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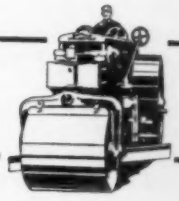

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The Piccadilly is "close to everything." Ninety per cent of your calls are within a few minutes' radius of this new hotel, and its short-cut location will save time (and taxi fare) in covering the town.

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And when you need relaxation, you are right in the center of theatres and amusements . . to say nothing of the Piccadilly's own "Silver Lining" Cocktail Room *Perfect.* De Luxe dinner or supper, with dancing in the Georgian Room, for one dollar!

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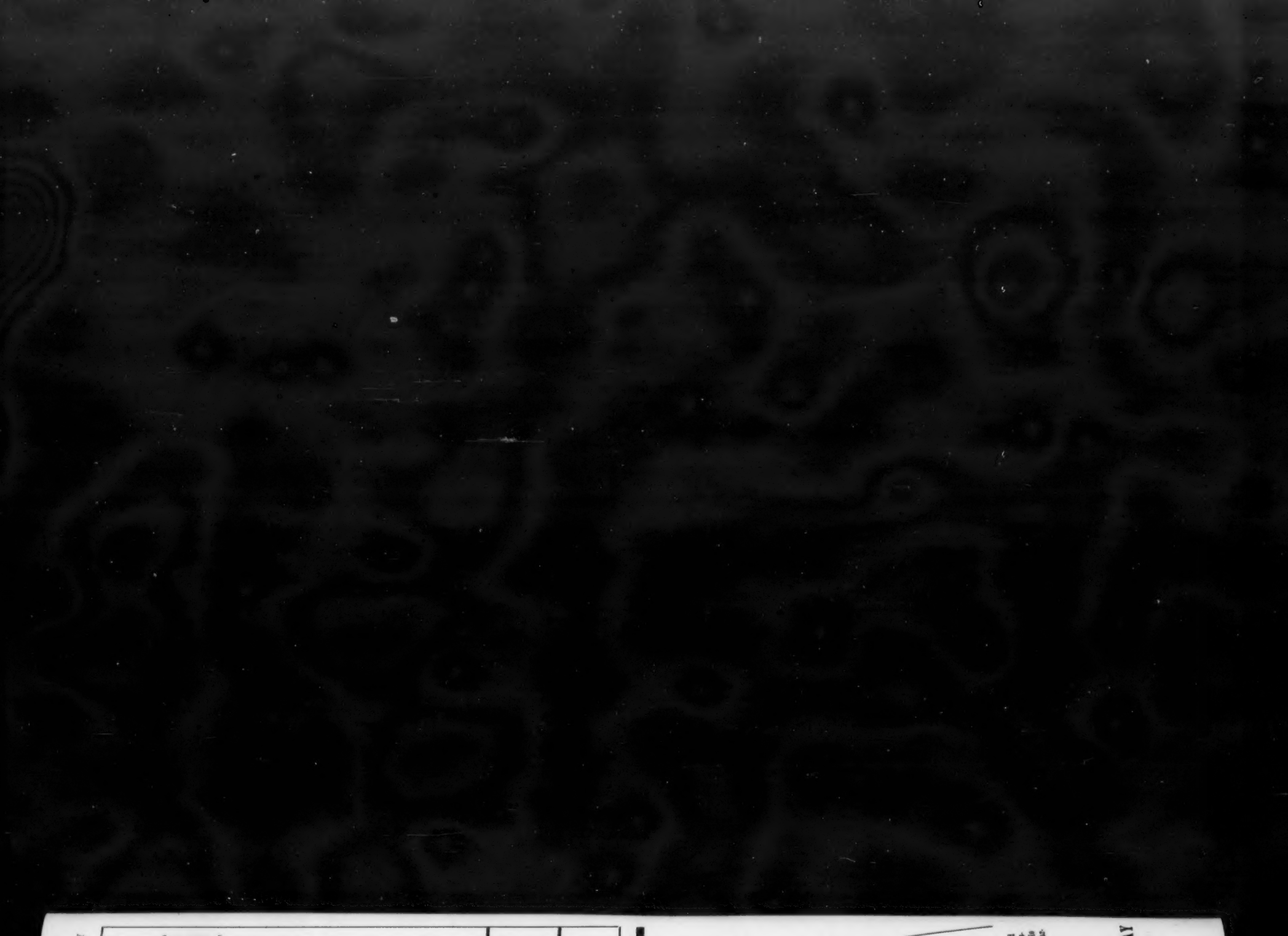

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The American City

York City - Triborough Bridge and
nd Central Parkway Improvement,
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